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IDENTIFIERS	Florida

ABSTRACT

A project was undertaken to revise a model competency-based trade and industrial education program that had been developed for use in Florida schools in a project that was implemented earlier. During the followup evaluation, the project staff compiled task listings for each of the following trade and industrial education program areas: automotive; building construction; child development; cosmetology; clothing production and fashion merchandising; data processing; drafting; electrical construction; gasoline engine mechanics; graphic design technology; solar and heating, air conditioning, refrigeration, and ventilation; technical mathematics; and welding. Next, a project advisory committee and a group of local employers reviewed the task listings, made recommendations for changes in them, determined the occupational skills needed by students in each program area, identified the major outcomes for the program and for each course of study, and identified the entry-level skills and the minimum performance levels for the program and for each course of study. Generally, the followup project participants were quite pleased with the original curriculum development effort. (The bulk of this volume consists of program maps or task listings and sets of objectives for each of the 13 program areas mentioned above.) (MN)

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ED247374

FL8213307

Final Report

Project Number DVE 2-2E11/3-2E21

From July 1, 1981 to June 30, 1983

Follow-Up Evaluation Project

FLORIDA DEPARTMENT OF EDUCATION
DIVISION OF VOCATIONAL EDUCATION
TALLAHASSEE, FLORIDA 32301

CE037242

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Workshop Consultant:

Dr. Richard A. Bedics
Dean, Health Related Education/Arts & Sciences
Pensacola Junior College

Curriculum Specialist:

*Royce Moore

Trade and Industrial Faculty Participants:

*James Bradshaw	Building Construction
Jack Breland	Automotive
Ralph Carlysle	Automotive
Joe Daudelin	Building Construction
John Gentry	Electrical Construction
Gerald Helzel	HARV
Joe Malphurs	Small Gasoline Engines
Orie Nelson	Cosmetology
Emil Raab	Automotive
*Robert Sundman	Welding
Tom Tillman	HARV
Ethel Williams	Cosmetology

Technical Education Faculty Participants

Dr. Andrew Evans	Technical Mathematics
**Jayne Grant	Graphics Design
**Frank Ling	Drafting

Home Economics Faculty Participants

**Roberta Elliott	Child Development
**Mary Short	Clothing Production/ Fashion Merchandising

Business Education Faculty Participants

**Bruce Gordon	Data Processing

* Phase I only
** Phase II only

PENSACOLA JUNIOR COLLEGE

June 9, 1983

Dr. Jack Fuller
Dean, Vocational Education
Santa Fe Community College
3000 N W 83rd Street
Gainesville, Florida 32602

Dear Jack:

I commend your faculty for the excellent work they recently did throughout the CAEL Program Mapping Curriculum Project. The faculty members who received the CAEL mapping training have used the CAEL process to establish clear learning outcomes for many of their vocational programs and have mapped these outcomes sequentially to assure the continuity of the programs. The enthusiasm of these faculty members was noticeably high throughout the project. I commend you also for the support you provided your faculty.

The very positive involvement of your faculty in this project has yielded input from potential employers of your graduates that was incorporated into the many program maps which were developed. Reports from your faculty have suggested that the advisory boards for your vocational programs exhibited a new level of excitement about the possible capabilities of graduates from your programs. The process of the faculty obtaining direct programmatic input from potential employers of your college's graduates has apparently established a high level of rapport between the faculty and the potential employers.

Please pass along a word of thanks to your faculty as I was most impressed with their professionalism and positive attitudes. I feel very proud to have been associated with such a fine, competent staff.

Sincerely,

Richard A. Bedics

R. A. Bedics, Dean
Health Related Education/Arts & Sciences

cc: Dr. Alan J. Robertson, President

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(904) 476-5410

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INTRODUCTION

Santa Fe Community College was awarded a Follow-Up Project Grant in 1981-82 and 1982-83. The first grant will be referred to as Phase I and the second will be referred to as Phase II. This project assisted vocational faculty to revise curriculum to better meet the needs of employers of students that complete vocational programs.

In 1980-81 the Trade and Industrial faculty at Santa Fe Community College used Staff and Program Development funds to visit the Ridge Vocational Technical Center. Following that visit, the faculty made a commitment to develop competency-based instructional programs and a commitment to our college goal to develop a model Trade and Industrial Educational program that would be equal to any in the nation. Because of this interest on the part of Trade and Industrial faculty, the college decided to become involved in the Follow-Up Project.

In 1981-82, Phase I, the Follow-Up Project was a curriculum revision process to assist faculty in implementing competency-based instruction in the Trade and Industrial program area. This was done to comply with the legislative mandate for restructuring vocational education A.S. degree programs in the Trade and Industrial area to Post-Secondary Adult programs. A Curriculum Specialist was employed by the College to assist faculty in developing competency-based instructional materials. Phase I involved 14 faculty participants.

Dr. Richard Bedics, Dean, Health Related Education/Arts & Sciences, from Pensacola Junior College, conducted three workshops on implementing competency-based instruction. For these workshops, each faculty participant utilized the three workbooks from the Council for the Advancement of Experiential Learning (CAEL).

Program Directors for Business Education and Technical programs as well as other vocational instructional support personnel were invited to the first workshop meeting in order to get an introduction and orientation to the project. It was planned that this same type project would be implemented in the future in other program areas.

In order to meet the specific objective of the project to identify and verify performance capabilities of students expected by potential employers, the following objectives were developed for Phase I, 1981-82, Follow-Up Project:

1. To attend all workshops and complete required workshop assignments.
2. To compile a task listing for each program area.
3. To form or reactivate an advisory committee.
4. To have advisory committee members and employers review task listings and make recommendations for changes.
5. To determine computational skills needed by student in each program area.

During Phase I, Dr. Andrew Evans, Coordinator for Technical Education at the College, worked with Trade and Industrial faculty to identify which computational skills were taught in each subject area and which ones were also expected by future respective employers in that program area. To do this, two studies were undertaken. The first study reviewed six general texts; four new hardback texts and two softback outlines. Four of these texts were compared to each specific booklet to determine which text provided the most coverage. The second study was an interview with workshop faculty. Their response to the subject matter in the text was recorded. Any additional subject matter required, and any preference as to a general text or booklet was also noted.

Between workshop meetings the Curriculum Specialist worked with the faculty participants individually on their materials. The final workshop meeting was held in St. Augustine. This meeting was designed to improve and increase communication between faculty members in Trade and Industrial Education.

The Follow-Up Project was continued in 1982-83, Phase II. The following objectives were added to the project:

6. To identify the major learning outcomes for the program and for each course of study.
7. To identify the entry level skills and the minimum exit performance levels.

Dr. Bedics and Dr. Evans continued to work with the faculty. The group was expanded to include five new faculty members in

these areas: Child Development, Graphics, Clothing Production and Fashion Merchandising, Drafting, and Data Processing. This new group worked on Objectives 1-7. The Trade and Industrial group refined and completed their curriculum projects to include the information for Objectives 6 and 7 in Phase II.

Dr. Andrew Evans helped faculty participants evaluate the technical mathematical needs of each program area in Phase II. Faculty members identified entry and exit mathematics competencies. Textbooks were reviewed to match competencies required in a program area to instructional materials available. Dr. Evans also developed concept maps for a Technical Mathematics I and II class. Child Development and Clothing Production & Fashion Merchandising programs would be well-served by Tech Math I or equivalent. Tech Math II would be used for Graphic Design, Drafting and Data Processing. The results of this part of the project are included in Section L, Technical Mathematics.

EVALUATION

The Follow-Up Project participants evaluated Phase I. The following indicate what was liked most about this part of the project: (1) they appreciated the time and related information to work on improving their program's curriculum; (2) they appreciated time to talk and share ideas with other instructors (Since Santa Fe Community College has day and night classes, some instructors are not on campus at the same time.); (3) Dr. Bedics' presentation and information were helpful.

The following indicate suggestions for changes that could be made in the projects: (1) more time during the work day to work on the project versus the weekend; (2) not enough of these types of inservice, would like more of this type project to work with employers; (3) decrease time of workshop from three sessions to two sessions with one workshop session having more specific information for the whole group; (4) meet at another college or vocational-technical center, to see competency-based instruction in action. This would allow Trade and Industrial faculty to ask questions of the instructor implementing the program they are observing.

The Follow-Up Project participants stated that this project upgraded the Trade and Industrial program in the following ways: (1) increased the awareness of campus administration about competency-based vocational education; (2) showed participants what on-campus support services were available but under-utilized;

(3) increased instructor contact with respective local employers.

Participants in Phase II of the Follow-Up Project evaluated it in the following way. They liked working at their own pace, having time to interact with other faculty members, and the increased communication and awareness this project promoted with advisory committee members.

The participants suggested the following as areas for change if conducting the project again. More time is needed to involve more people within a program area and potential future employers. Instructors would like to visit other programs to gain insight into scope, sequence and placement of instructors in programs similar to their own.

The participants stated that Phase II upgraded their programs by: (1) helping to sequence courses and organize course materials; (2) adding specialty proficiency certificates for options within a program; (3) helped to keep course material current and relevant.

SAMPLE PROJECT

Each participant developed a program map, a task listing or set of objectives for the courses in that program, and the entry level skills needed by students for that program. In the following section of this report are examples of what was developed for each program. This does not include every task list or objective for every program because of the space it would require. This does not include any instructional materials or support materials used by the instructor. These materials are available and could be requested from that program area.

SAMPLE PROJECTS INDEX

SECTION	PROGRAM	PAGE NUMBER
A	Automotive	9
B	Building Construction	18
C	Child Development	26
D	Cosmetology	37
E	Clothing Production & Fashion Merchandising	54
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G	Drafting	72
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J	Graphic Design Technology	103
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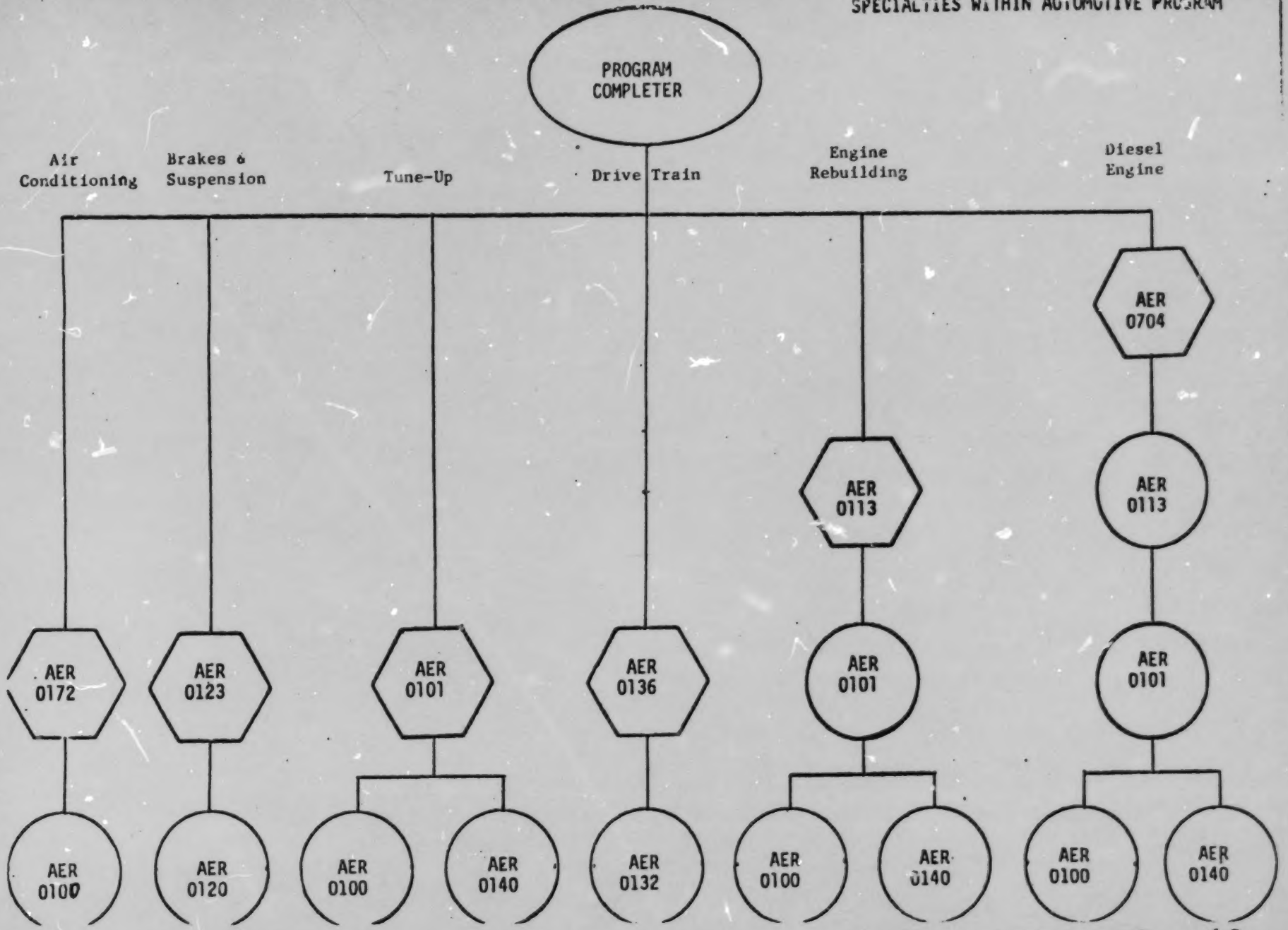
L	Technical Mathematics	123
M	Welding	145

AUTOMOTIVE

SPECIALTIES WITHIN AUTOMOTIVE PROGRAM



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ENTRY LEVEL SKILLS COMPETENCE
AUTOMOTIVE

Competency - What should the student know (basic skills) in order to have a successful learning experience?	Rationale - Why is the entry level competency needed?	Program Competency - How is this competency related to the program and/or world of work?	Evaluation - How will the student be tested to indicate he/she has reached the competency desired?
Tenth grade reading level	Minimum level for texts and manuals for training program and entry level work.	The student must be able to read manufacturer's manuals and comprehend written instructions.	Testing and upgrading will be carried out by IMTS lab.
Handwriting	A desirable trait for an automotive technician.	Written description of tasks performed, and the ability to take tests to prove knowledge of subject.	Application for program entry by IMTS lab.
Verbal communication	Student must communicate with instructor and fellow students.	To communicate with customers and shop personnel and in the updating process.	Interview through work exploration program.
Math	To maintain personal records and determine component condition through measurement.	To evaluate costs of labor and parts and calculate his earned percentage.	Testing and upgrading carried out by IMTS lab.
Manipulative skill, manual dexterity, & physical mobility	Automotive technician's work can be physical, the use of tools is required and includes lifting, bending, and stooping.	The student is required to use hand, electrical, and air tools in the program and in industry to measure, disassemble, repair, etc., without harm to himself or others.	Through evaluation in the work exploration program and subjective by the instructor.
Intelligence, reasoning, and comprehension	Automotive technician requires organization, concentration, memory, and problem solving.	To understand instructor while learning tasks and duties of auto technicians, and apply theory taught to problem solving.	Evaluation through work exploration program.
Positive attitude toward work. (A) In structured organizations.	Auto technicians generally work in situations with a highly defined hierarchy.	The technician is hired to produce profit for the employer but must have respect for fellow workers & his superiors.	Evaluation through work exploration and subjective with the instructor.

Competency - What should the student know (basic skills) in order to have a successful learning experience?	Rationale - Why is the entry level competency needed?	Program Competency - How is this competency related to the program and/or world of work?	Evaluation - How will the student be tested to indicate he/she has reached the competency desired?
(B) With others and in teams	Auto technicians work in situations requiring cooperation with peers, superiors, and customers.	Ability to produce profitable work for employer while assisting peers, superiors, and satisfying customers.	Subjective by instructor during the course of the program.
Pride in personal accomplishments.	The auto technicians work is physically & mentally demanding, but has a monitary reward.	Self-esteem and competency must be enhanced by the learning experience if the student is to succeed.	Subjective evaluation by instructor.

AUTOMOTIVE MECHANICS

	COURSE REQUIREMENTS	CONTACT HOURS
AER 0100	Electrical I	90
AER 0172	Air Conditioning & Heating	90
AER 0101	Electrical II - Tune-up	90
AER 0140	Fuel, Exhaust and Emission	90
AER 0132	Standard Transmission & Drive Lines	90
AER 0136	Automatic Transmissions	90
AER 0123	Steering, Suspension & Wheels	90
AER 0120	Brakes	90
AER 0113	Engine Rebuilding	90
AER 0704	Diesel Engines	90
	TOTAL HOURS	900

The automotive program offers several options in specialized areas of the automotive field. These areas of learning require from 180 to 450 hours of instruction.

Tune-Up Option

Practically every automotive shop does tune-ups on automobiles. These courses enable students to gain valuable information and experience in tune-up work.

		Contact hours
AER 0100	Electrical 1	90
AER 0140	Fuel, Exhaust, & Emissions	90
AER 0101	Electrical II - Tune-Up	90
	Total	270 hours

Engine Rebuilding Option

For students interested in engine work, you will find that this option will fulfill the need and desire to overhaul engines.

AER 0100	Electrical I	90 hours
AER 0140	Fuel, Exhaust, & Emissions	90
AER 0101	Electrical II - Tune-Up	90
AER 0113	Engine Rebuilding	90
	Total	360 hours

Automatic Transmission Option

This is a specialized field of automotive repair that is challenging. Students will be able to start at an entry level in automotive transmissions upon completion of this option.

AER 0132	Standard Transmission & Drive Line	90 hours
AER 0136	Automatic Transmissions	90
	Total	180 hours

Steering & Suspension & Wheels Option

Many automotive shops and most tire dealers have front end equipment and brake repairs. This option offers an excellent opportunity to students who prefer this type of work.

AER 0120	Brakes	90 hours
AER 0123	Steering, Suspension & Wheels	90
	Total	180 hours

Diesel Engine Option

With the fuel shortage of today, diesel engines are becoming very popular due to their efficient fuel mileage. This course offers the latest information for working on and maintaining diesel engines.

AER 0100	Electrical I	90 hours
AER 0140	Fuel, Exhaust, & Emissions	90
AER 0101	Electrical II - Tune-Up	90
AER 0113	Engine Rebuilding	90
AER 0704	Diesel Engine	90
	Total	450 hours

Air Conditioning & Heating Option

About 90% of the vehicles on the road today have air conditioners, therefore; many shops specialize in air conditioning work. For the student who is looking for a good field of work, this is an excellent choice.

AER 0100	Electrical I	90 hours
AER 0172	Air Conditioning & Heating	90
	Total	180 hours

ENTRY LEVEL AUTOMOTIVE TECHNICIANS

Skills Definition:

Diagnoses, repairs, and/or overhauls the various system of the automotive vehicle. Plans work procedures with the aid of charts, technical manuals, and service bulletins. Disassembles and inspects components using precision measuring instruments, meters, gauges, and oscilloscope. Repairs or replaces parts as needed to achieve efficient and safe operation of the automotive vehicle. Is knowledgeable of the operational theory of the various components and systems of the automotive vehicle. Proves his workmanship by testing before considering the repair or repairs complete. Communicates with peers, supervisors, and customers regarding his work.

Major Program Outcomes:

The student will complete the course with a minimum grade of 70% on all written exams. He will complete the assigned number of Performance Objectives with 100% accuracy.

At the completion of the program, the student will be awarded a certificate that entitles him to enter into the automotive repair field as an entry level mechanic.

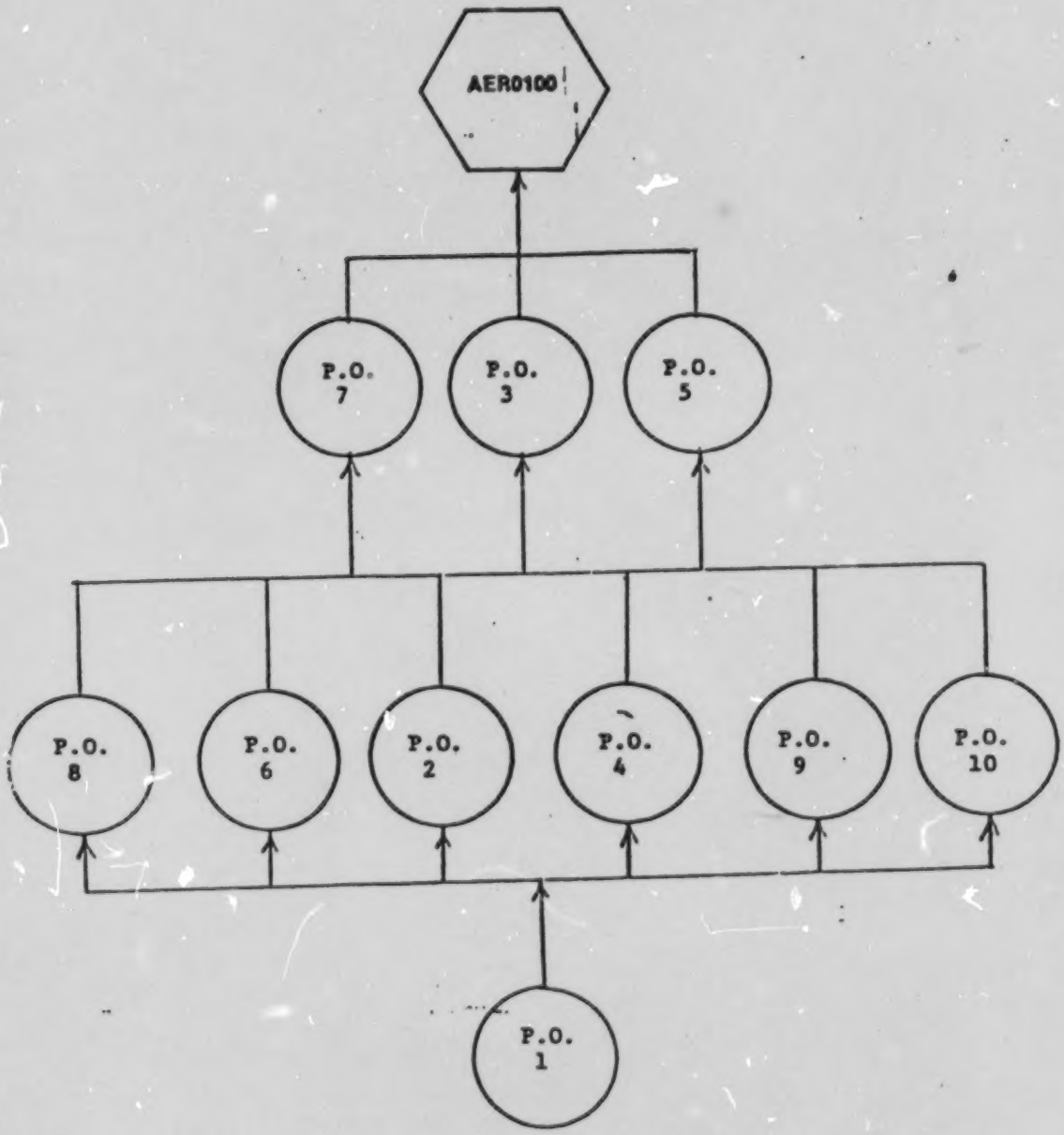
Learning Outcomes For Each Course:

The student will be able to perform at least 70% of the performance objectives listed in each of the ten courses. The student will complete the performance objectives with 100% accuracy.

The student will complete the Post Tests in each of the ten courses with 70% correct answers.

ELECTRICAL I

Introduction to basic electrical theory and safety. Nomenclature of electrical parts and components will be taught. Batteries, charging and starting systems will be covered along with lights and accessories. Diagnosis and repair of various system components will be performed in the shop.



PERFORMANCE OBJECTIVE DESCRIPTIONS LISTED ON NEXT PAGE

SAMPLE TASK LISTING FOR AUTOMOTIVE PROGRAM COURSE

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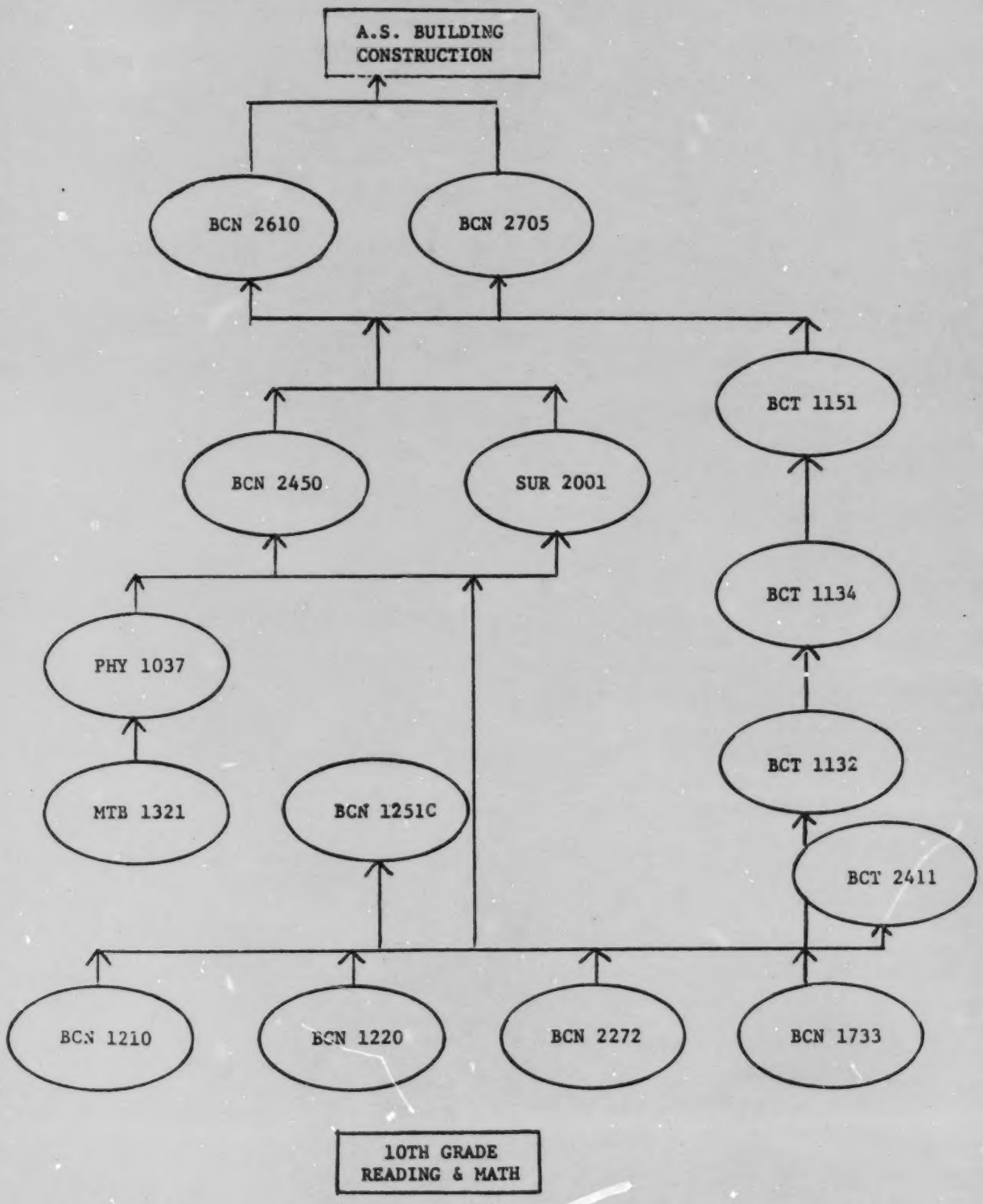
PERFORMANCE OBJECTIVE DESCRIPTIONS

P.O. 1: Test and Service the Battery
P.O. 2: Test and Analyze Malfunctions in the Cranking System
P.O. 3: Overhaul, Test, and Replace the Starter Assembly
P.O. 4: Test and Analyze Malfunctions in the Charging System
P.O. 5: Overhaul, Test, and Replace the Alternator
P.O. 6: Inspect the Lighting System
P.O. 7: Test, Adjust, and Replace Switches
P.O. 8: Test and Replace Instrument Panel Units
P.O. 9: Test and Service the Windshield Wiper System and the Windshield Washer System
P.O. 10: Test and Service the Cruise Control System

BUILDING CONSTRUCTION

BUILDING CONSTRUCTION

A.S. DEGREE



MAP - KEY
BUILDING CONSTRUCTION
A. S. - DEGREE

BCN 1210	Building Construction Materials	3 Hours
BCN 1220	Construction Methods	3
BCN 1251C	Light Construction Drafting	3
BCN 2020	Related Specialty Trades	3
BCN 2272	Blueprint Reading	3
BCN 2450	Structural Design	3
BCN 2610	Construction Estimating	3
BCN 2705	Construction Management	3
BCN 1132	Construction I	4
BCT 1134	Construction II	4
BCT 1151	Construction III	4
BCT 2411	Basic Skills & Techniques of Masonry	4
SUR 2001C	Construction Surveying	3
BCN 1733	Construction Safety & Codes	3
	TOTAL	46 Hours

BEGINNING LEVEL

Competency - What should the student know (basic skills) in order to have a successful learning experience?	Rationale - Why is the entry level competency needed?	Program Competency - How is this competency related to the program and/or world of work?	Evaluation - How will the student be tested to indicate he/she has reached the competency desired?
Reading level: 10th grade	Technical manuals and textbooks are written at this level.	The preponderance of technical information in the theory courses is acquired by reading.	Test by IMTS-Lab
Legible handwriting	Student-instructor communication.	Testing, term papers, work orders, employer-employee communication must be readable.	Student counseled in this area by instructor handling courses in Building Construction.
Verbal communication	The student must understand oral instruction and be able to express himself/herself effectively in standard English.	Direct information exchanges occur between students and teachers.	Observation at initial by IMTS-Lab
General math	To comprehend instruction, the student must be able to carry out the four basic arithmetical operations with whole numbers.	Usual arithmetic in record-keeping, estimating, and cost reports.	Pre-test by IMTS-Lab
Manual dexterity	Use of hand tools, instruments-meters	The laboratory component requires hand-eye coordination within time constraints.	Observation
Sensory capabilities	The student must have normal or corrected sight and hearing.	Instructions and warnings are frequently spoken. Also, sounds are cues in diagnosing problems.	Interview or physician's statement.
Physical capabilities	Full range of hand and arm motion, and locomotion without crutches or wheelchair.	Certain situations require the use of two hands while one is perched on a ladder.	Interview by Counselor

BUILDING CONSTRUCTION

BCN 1210	BUILDING CONSTRUCTION MATERIALS	3	D

A study of basic materials and other supplies used in light construction, identification, uses, manufacturers, and structure of lumber.

BCN 1220	CONSTRUCTION METHODS	3	D

A study of the various systems, methods and equipment available to perform the major elements of a complete light construction project, and analysis of the factors governing the choice of each.

BCN 1251C	LIGHT CONSTRUCTION DRAFTING	3	D

Application of basic drafting principles as they apply to light construction in architecture.

BCN 2020	RELATED SPECIALTY TRADES	3	D

An introduction to the requirements, design and construction of utilities and environmental control systems, which are an integral part of modern structures.

BCN 2272	BLUEPRINT READING	3	O

Principles of interpreting blueprints and specifications common to the building trades. Practice in reading details for grades, foundations, floor plans, elevations, walls, doors and windows, and roofs of buildings. (Also offered with special emphasis on HARV and electrical service for students in those programs.)

BCN 2450	STRUCTURAL DESIGN	3	D

An introduction to physical science of applied mechanic, with emphasis placed on sizing of simple members of wood and steel for light construction. Prerequisite: PHY 2003

BCN 2610	CONSTRUCTION ESTIMATING	3	D

Preparation of a complete estimate from take-off to bid proposal, and the usual role of the estimator as a member of the construction organization.

BCN 2705	CONSTRUCTION MANAGEMENT	3	D

An introduction to the basic skills needed to run a light construction office, with emphasis placed on bookkeeping and cost control systems used in a modern construction organization.

BCT 1132	CONSTRUCTION I	4	0

Principles and practices of frame construction including sills, floor joists, ceiling joists, studs, bridging, bracing, sheathing, sub floors. Prerequisites: BCT 1220 and BCT 1022

BCT 1134	CONSTRUCTION II	4	0

Roof construction, styles, types, and combinations. Rafter and truss construction. Sheathing, flashing, and finishing. Prerequisite: BCT 1132.

BCT 1151	CONSTRUCTION III	4	0

Interior and exterior finishes. Selection of sheathing, form and moldings. Application of interior and exterior finish materials. Prerequisite: BCT 1134

BCT 2411	BASIC SKILLS AND TECHNIQUES OF MASONRY	4	0

Principles and practices of masonry construction. Care and use of tools, materials and equipment. Basic skills and manipulative practices of brick and block laying.

SUR 2001C	CONSTRUCTION SURVEYING	3	D

Practical experience in plane surveying with emphasis on care and use of instrument, field notes, simple site plan work, elevations, and traverse. Prerequisite: PHY 2003

BCN 1733	CONSTRUCTION SAFETY & CODES	3	0

A course of study in safety requirements by regulatory agencies pertaining to the construction industry. Shop safety, first aid practices and accident prevention awareness will be included. Students will also receive training in C.P.R.

BCN-1210-CONSTRUCTION MATERIALS

DUTY A IDENTIFYING WOOD PROPERTIES

1) Identify Grading Rules
2) Identify Sizes and Species
3) Identify Manufacturing Processes

DUTY B IDENTIFYING PORTLAND CEMENT PROPERTIES

1) Identify Manufacturing Process
2) Identify Properties
3) Identify Aggregates Use in

DUTY C EVALUATING DESIGN AND CONTROL OF CONCRETE

1) Identify Types Used
2) Identify Test Used
3) Evaluate Mixing and Transportation of

DUTY D EVALUATING CONCRETE ADMIXTURES

1) Evaluate Effect on Concrete
2) Identify Types
3) Explain Why Used

DUTY E EVALUATING CONCRETE MASONRY UNITS

1) Identify Types
2) Identify Sizes
3) Evaluate Properties of

DUTY F EVALUATING PRECAST CONCRETE

1) Identify Types
2) Evaluate Advantages of
3) Identify Material Make-up.

DUTY G EVALUATING BRICK AND CLAY TILE

1) Identify Manufacturing Processes
2) Identify and Evaluate Patterns
3) Identify Properties

DUTY H EVALUATING BUILDING STONE

1) Identify Types
2) Evaluate Advantages of
3) Identify Productions Processes
4) Explain Uses in Building Industry

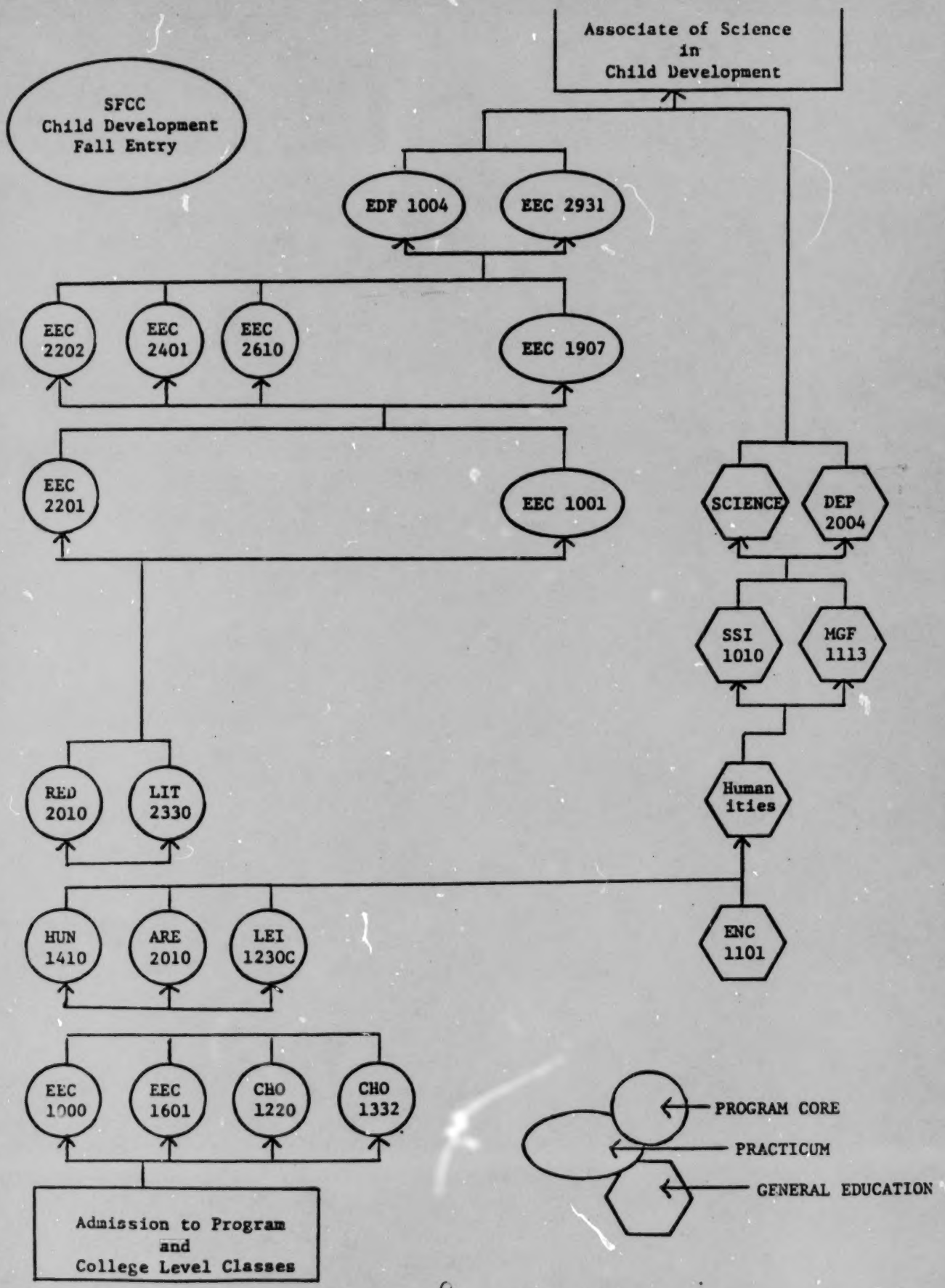
DUTY I EVALUATING FERROUS AND NONFERROUS METALS

1) Identify Production Processes
2) Identify Types
3) Identify and Evaluate Material Make-up

DUTY J EVALUATING EXTERIOR, INTERIOR, AND INSULATION MATERIALS

1) Identify Types
2) Evaluate Properties

CHILD DEVELOPMENT


Associate of Science
in
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1332
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College Level Classes
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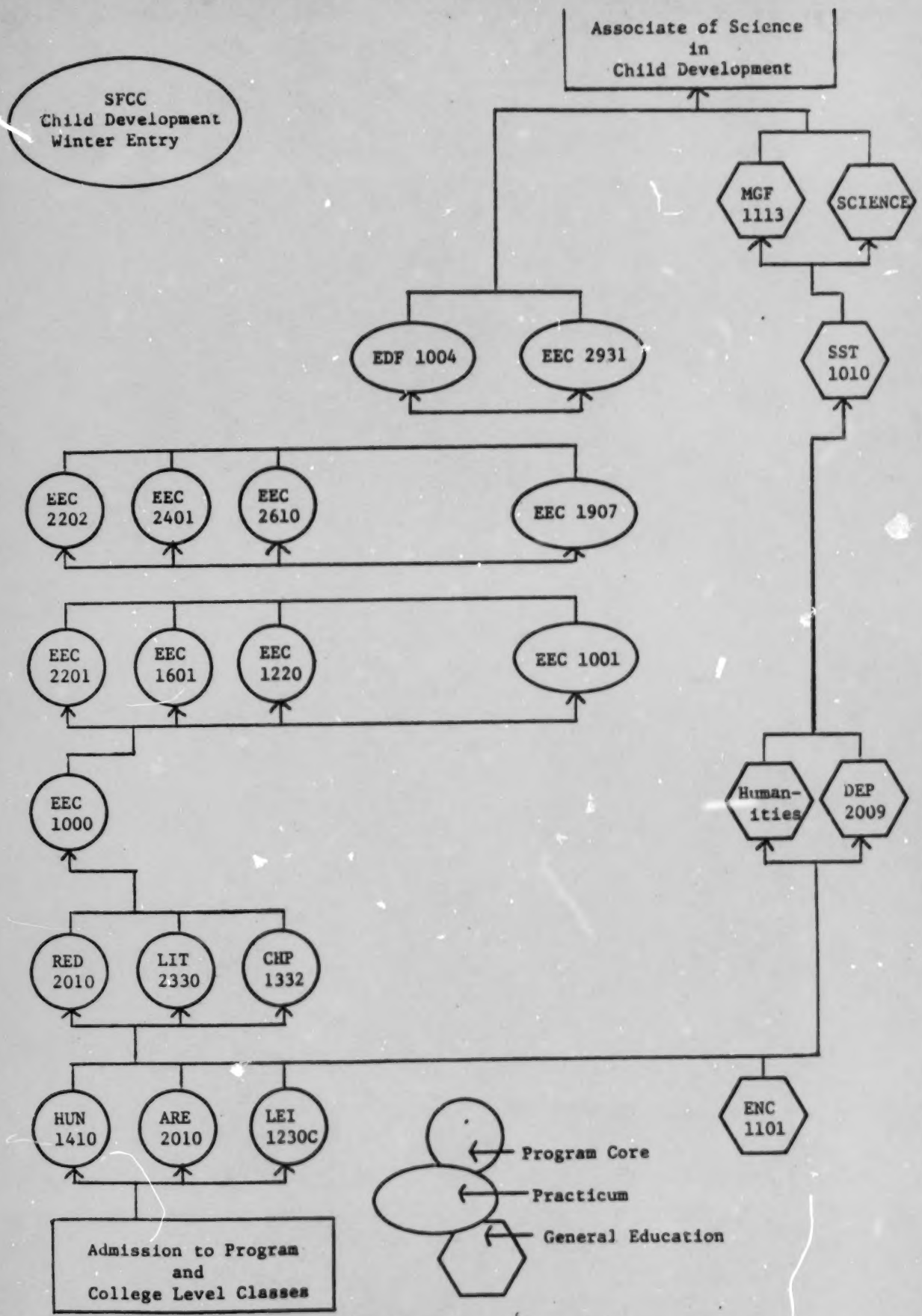
PRACTICUM
GENERAL EDUCATION


SFCC
Child Development
Winter Entry
Associate of Science
in
Child Development
MGF
1113
SCIENCE
EDF 1004
EEC 2931
SST
1010
EEC
2202
EEC
2401
EEC
2610
EEC 1907
EEC
2201
EEC
1601
EEC
1220
EEC 1001
EEC
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Human-
ities
DEP
2009
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2330
CHP
1332
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1410
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2010
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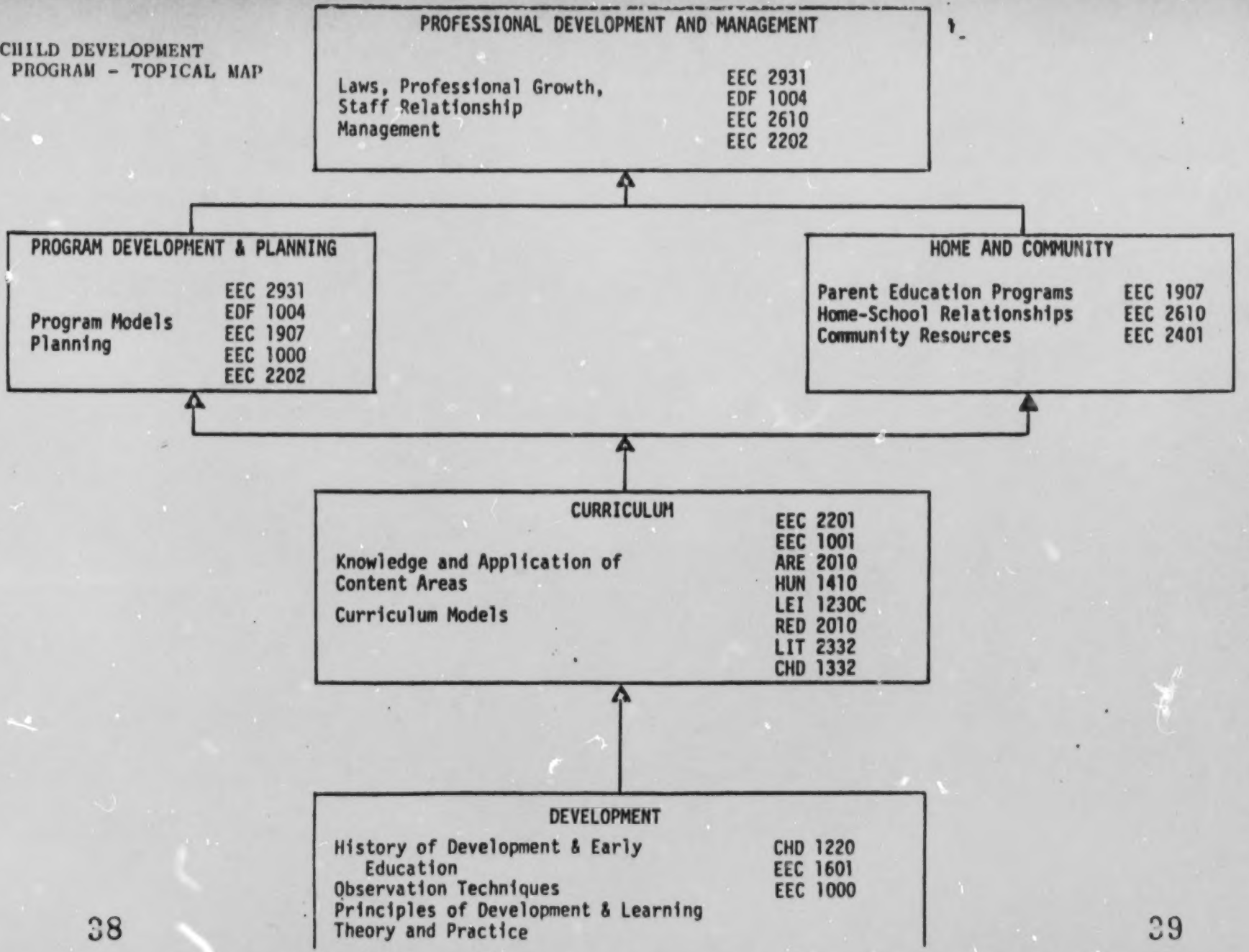
ENC
1101
Program Core
Practicum
General Education
Admission to Program
and
College Level Classes

CHILD DEVELOPMENT
PROGRAM - TOPICAL MAP



CHILD DEVELOPMENT PROGRAM

Entry and Exit Level Skills

Math

Entry Level

ACT Score - Math 16 ⟶

Student should be able to:

- add, subtract, multiply, divide
- whole #s, fractions, decimals

Exit Level

MGF 1113 ⟶ C or above
(Principles of Math)

Communications

Entry Level

ACT Score - 15 ⟶

Eligibility to be determined by English Dept.

Exit Level

ENC 1101 ⟶ C or above
(College Composition)

CHILD DEVELOPMENT

CHD 1220	CHILD DEVELOPMENT FOR TEACHERS OF YOUNG CHILDREN	3	D

An introductory course in the physical, social, and cognitive development of the child, prenatal-preschool.

CHD 1332	CREATIVE EXPERIENCES FOR THE YOUNG CHILD	3	D

Exploring and understanding the value and purpose of creative experiences in the development of the young child.

CHD 2381	EDUCATING THE YOUNG THINKER	3	O

This course will assist the student in developing an understanding of the young child as a thinker and problem solver. The student will learn how to enhance the development of these skills in a classroom environment.

EEC 1000	INTRODUCTION TO CHILD DEVELOPMENT AND EDUCATION	3	D

An overview of childhood education; historical and philosophical perspectives.

EEC 1001	EDUCATION FOR THE YOUNG CHILD	3	D

Studying the young child in the pre-school environment.

EEC 1601	OBSERVING AND RECORDING BEHAVIOR	3	D

Techniques for observing and recording the behavior of young children Observation facilities are provided at Santa Fe Little School.

EEC 1907	DIRECTED OBSERVATION AND PARTICIPATION - EARLY CHILDHOOD	3	D

Special focus on curriculum and the home/school relationship.

EEC 2201	CURRICULUM IN CHILDHOOD EDUCATION	3	D

Introduction to curricular content in early learning centers.

EEC 2202	PROGRAM DEVELOPMENT IN CHILDHOOD EDUCATION	3	D

A survey of program models in Early Childhood Education.

EEC 2401	HOME AND COMMUNITY IN CHILDHOOD EDUCATION	3	D

The dynamics of the relationship of home, school, and community in Early Childhood Education.

EEC 2931	SEMINAR IN CHILDHOOD EDUCATION	3	O

A small group investigation and discussion of selected topics in child development and education.

HUN 1410	NUTRITION FOR CHILDREN	3	D

Application of basic nutrition for infant and pre-school children. Requirements at different stages of growth and development will be covered. Food standards and service for day care centers will also be included.

CHILD DEVELOPMENT PROGRAM
MAJOR PROGRAM OUTCOMES

The Child Development Program graduate will be able to describe the evolution of child development and education. He/She will also be able to define contemporary learning and development theories.

The Child Development Program graduate will be able to describe major developmental theories, and name theorists associated with each. He/She will be able to list and describe the prenatal development of the child and the physical, emotional, social and cognitive development of the chid from birth to 12 years.

The Child Development Program graduate will be able to describe and demonstrate knowledge, purpose, and application of curriculum areas which foster the physical, emotional, social and cognitive development of the infant and child.

The Child Development Program graduate will be able to describe program models which reflect maturational, behavioral, and cognitive viewpoints and to construct, define, and defend a personal program model which reflects the developmental needs of a group of infants and/or children.

The Child Development Program graduate will be able to define various parental education models and to develop a program of parent education and involvement which reflects the needs of a particular group of parents, children, and staff.

The Child Development Program graduate will be able to describe and apply the rules governing infant and child care at the local, state, and federal level. He/She will also be able to describe and apply principles of sound management.

SECTION I.

PERFORMING ROUTINE DUTIES

RATING SCALE: -1 = Disadvantage
0 = Unimportant
1 = Slight importance
2 = Moderate importance
3 = Great importance

		-1	0	1	2	3
I-A.	SAFETY					
1.	Practice good safety habits					
2.	Implement safety procedures concerning accidents					
3.	Implement safety procedures concerning disasters					
I-B.	HEALTH					
4.	Practice good health habits					
5.	Supervise routine bathroom activities					
6.	Guide rest period					
7.	Supervise care of teeth					
8.	Implement procedures concerning illnesses					
9.	Supervise snack and/or meal					
10.	Prepare snacks and/or meals					
11.	Set and clear table					
12.	Serve food					
I-C.	CLERICAL					
13.	Answer phone and take messages					
14.	Maintain children's attendance records					
I-D.	HOUSEKEEPING					
15.	Keep child care environment safe, healthy, and clean					
16.	Check toys for safety and damages and make minor repairs					
17.	Involve children in housekeeping activities					
18.	Provide attractive setting					

COMMENTS FOR SECTION I: PERFORMING ROUTINE DUTIES:

SECTION II.

IMPLEMENTING THE CHILD CARE PROGRAM

RATING SCALE:
-1 = Disadvantage
0 = Unimportant
1 = Slight importance
2 = Moderate importance
3 = Great importance

		-1	0	1	2	3
II-A.	CHILD GUIDANCE					
19.	State principles of growth and development					
20.	Enhance self esteem					
21.	Encourage independence					
22.	Assist with program for infants					
23.	Assist with program for toddlers					
24.	Assist with program for school-aged children					
25.	Assist with program for exceptional children					
II-B.	LEARNING ENVIRONMENT					
26.	Use space effectively					
27.	Use time effectively					
28.	Provide areas for free-choice play activities					
29.	Store equipment and supplies					
30.	Plan for equipment and supplies to aid in child development					
II-C.	PHYSICAL DEVELOPMENT AND OUTDOOR ACTIVITIES					
31.	Plan for outdoor play and learning activities					
32.	Prepare for outdoor play					
33.	Supervise outdoor learning activities					
II-D.	SOCIAL AND EMOTIONAL DEVELOPMENT					
34.	Identify what children learn through play					
35.	Provide dramatic play experiences in daily activities					
36.	Guide individual child's behavior					
37.	Guide group behavior					
II-E.	BASIC SKILLS					
38.	Provide math experiences					
39.	Provide field trips in program					
40.	Use resource persons in program					

(continued)

SECTION II.

IMPLEMENTING THE CHILD CARE PROGRAM

(continued)

RATING SCALE:
-1 = Disadvantage
0 = Unimportant
1 = Slight importance
2 = Moderate importance
3 = Great importance

II-E. BASIC SKILLS (continued)	-1	0	1	2	3
41. Provide holiday celebrations and parties in program . .					
42. Provide science experiences					
43. Provide activity in which children prepare food					
44. Provide language arts experiences					
45. Provide creative experiences					
46. Provide music experiences					
47. Demonstrate ways to stimulate motor development and creative movement					

II-F. LESSON PLANS	-1	0	1	2	3
48. Plan daily activities					
49. Plan weekly activities					
50. Plan monthly activities					

COMMENTS ON SECTION II: IMPLEMENTING THE CHILD CARE PROGRAM

SECTION III.

DEVELOPING PROFESSIONALLY AND PERSONALLY

RATING SCALE:
-1 = Disadvantage
0 = Unimportant
1 = Slight importance
2 = Moderate importance
3 = Great importance

	-1	0	1	2	3
III-A. HOME-CENTER RELATIONSHIPS					
51. Be alert to and report family information					
52. Communicate with parents					
III-B. STAFF INTERACTION					
53. Indentify staff roles					
54. Participate effectively as a child care team member . .					
55. Identify value of staff conferences					
56. Report to supervisor					
III-C. PROFESSIONAL AND PERSONAL GROWTH					
57. Identify general and individual characteristics of personal growth					
58. Demonstrate continuing professional growth					
59. Evaluate personal commitment to caring for children . .					
60. State legal requirements of licensing					
III-D. CHILD CARE OCCUPATIONS					
61. Identify opportunities for employment in child care occupations					
III-E. CONSUMER EDUCATION					
62. Manage time and money to reach goals					
III-F. GOALS AND TEACHING STRATEGIES					
63. Describe how your ideas about children affect what and how you teach					

COMMENTS ON SECTION III: DEVELOPING PROFESSIONALLY AND PERSONALLY

COMMENTS ON TOTAL PROGRAM:

COSMETOLOGY

Program Goals

The cosmetology student will be qualified to take the cosmetology examination for licensing given by the Department of Professional Regulation and the State Board of Cosmetology upon completion of the minimum requirements of 1200 contact hours of instructions.

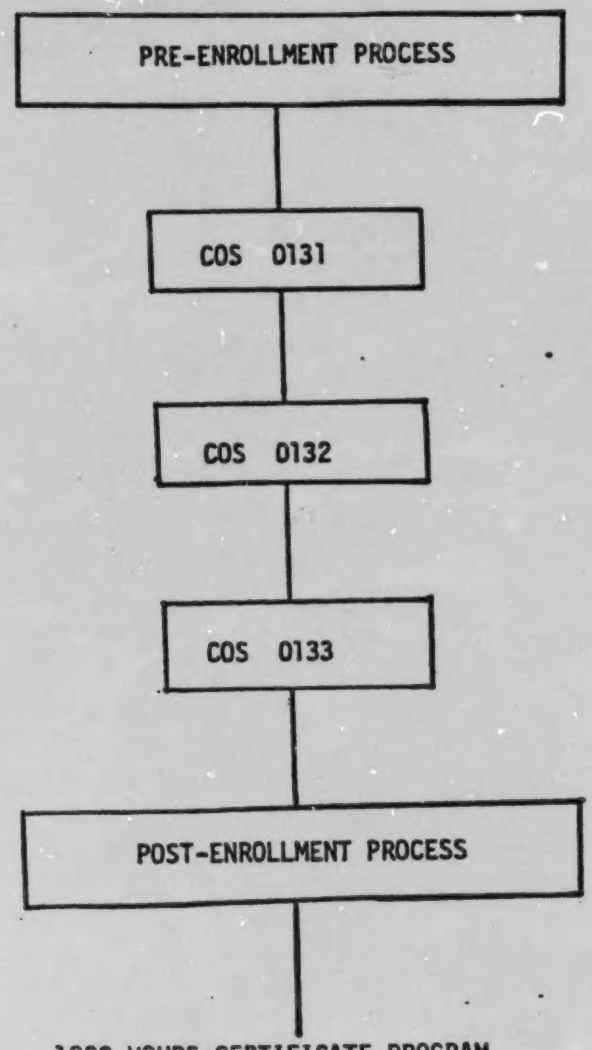
From this program of instruction the cosmetology student will demonstrate acquired knowledge in Florida Law, bacteriology, study of the skin and hair chemistry and techniques applied in the cosmetology field with no less than 85% competency.

The cosmetology student will be able to perform the following practical skills: sanitation procedures, shampooing hair and scalp treatments, styling, hair shaping, chemical relaxing, permanent waving, hair coloring, facial and hair removal and nail care. These skills must be performed at 100% level of proficiency.

The cosmetology student will acquire knowledge of the safty precautions to be observed in the school and industry utilizing techniques that insure personal and public safety and develop good work habits and attitudes of professional conduct. Safety skills must be performed at 100% of proficiency.

Note:

A 900 hour program for high school students has been developed using the same program goals and task listings. After completing the high school program the student may continue in the post-secondary program.


PRE-ENROLLMENT PROCESS
COS 0131
COS 0132
COS 0133
POST-ENROLLMENT PROCESS
1200 HOURS CERTIFICATE PROGRAM

COURSE DESCRIPTION

. COSMETOLOGY

COS 0131 **Introduction to Cosmetology I** **450 Contact Hours**

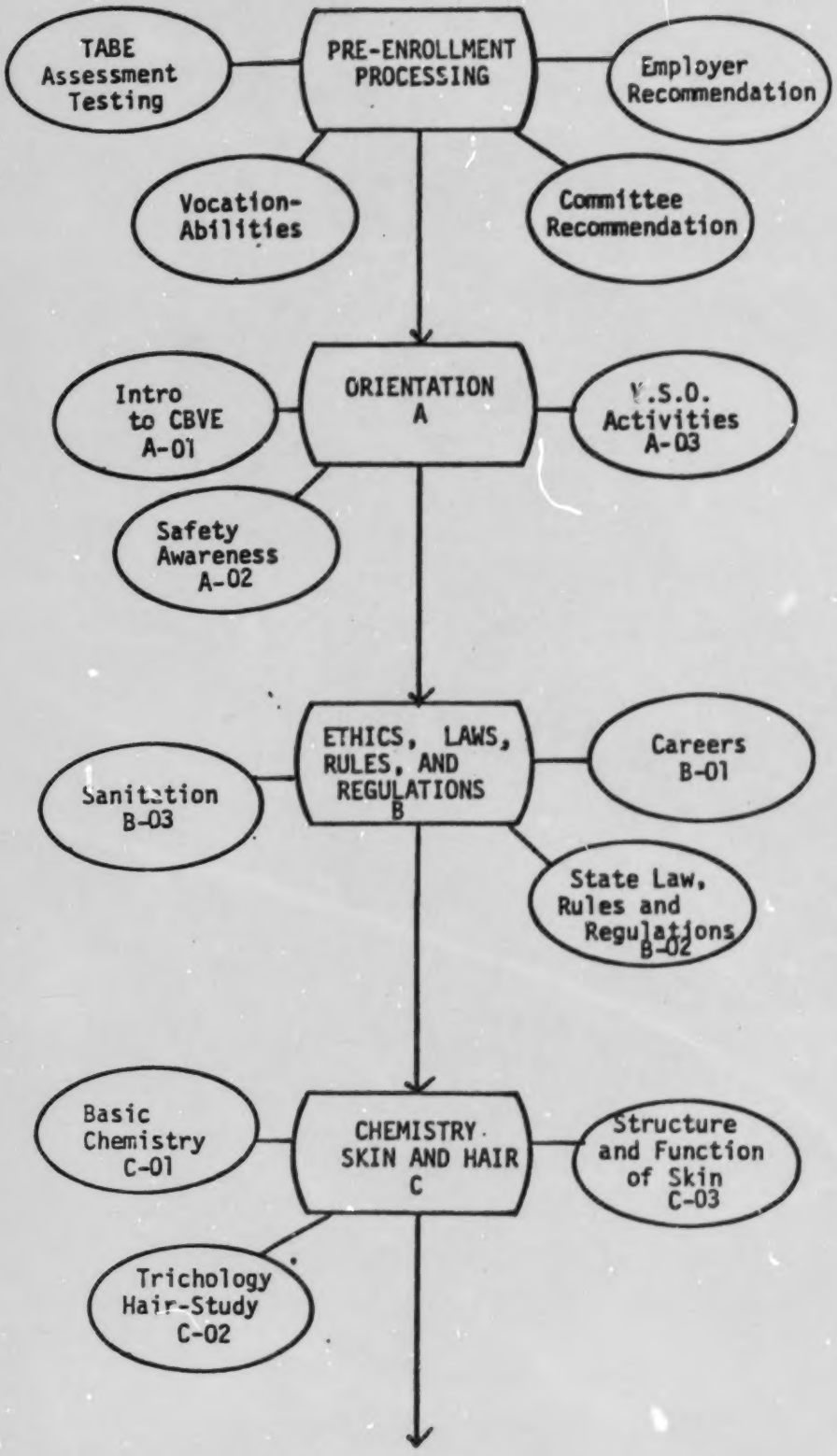
Introduction to Competency-based Cosmetology; Orientation, Cosmetology Law, rules and regulations, ethics, chemistry, sanitation, study of the hair and skin. Basic skills and techniques in shampooing, rinses, hair and scalp treatments, hair styling, hair shaping, cold waving, chemical straightening, hair coloring and lightening, facial care, hair removal, manicuring and pedicuring with minimal performance competency.

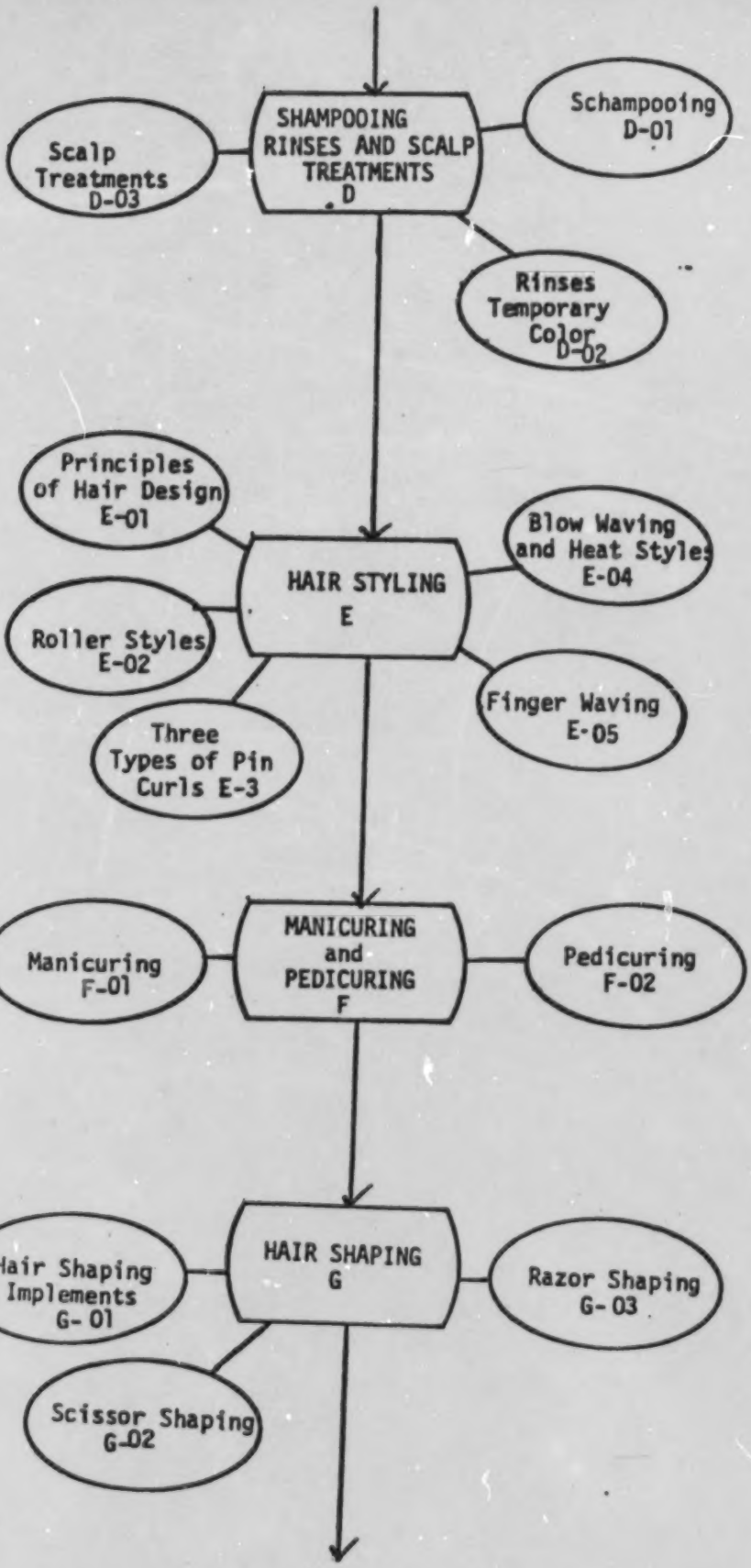
COS 0132 **Cosmetology II** **450 Contact Hours**

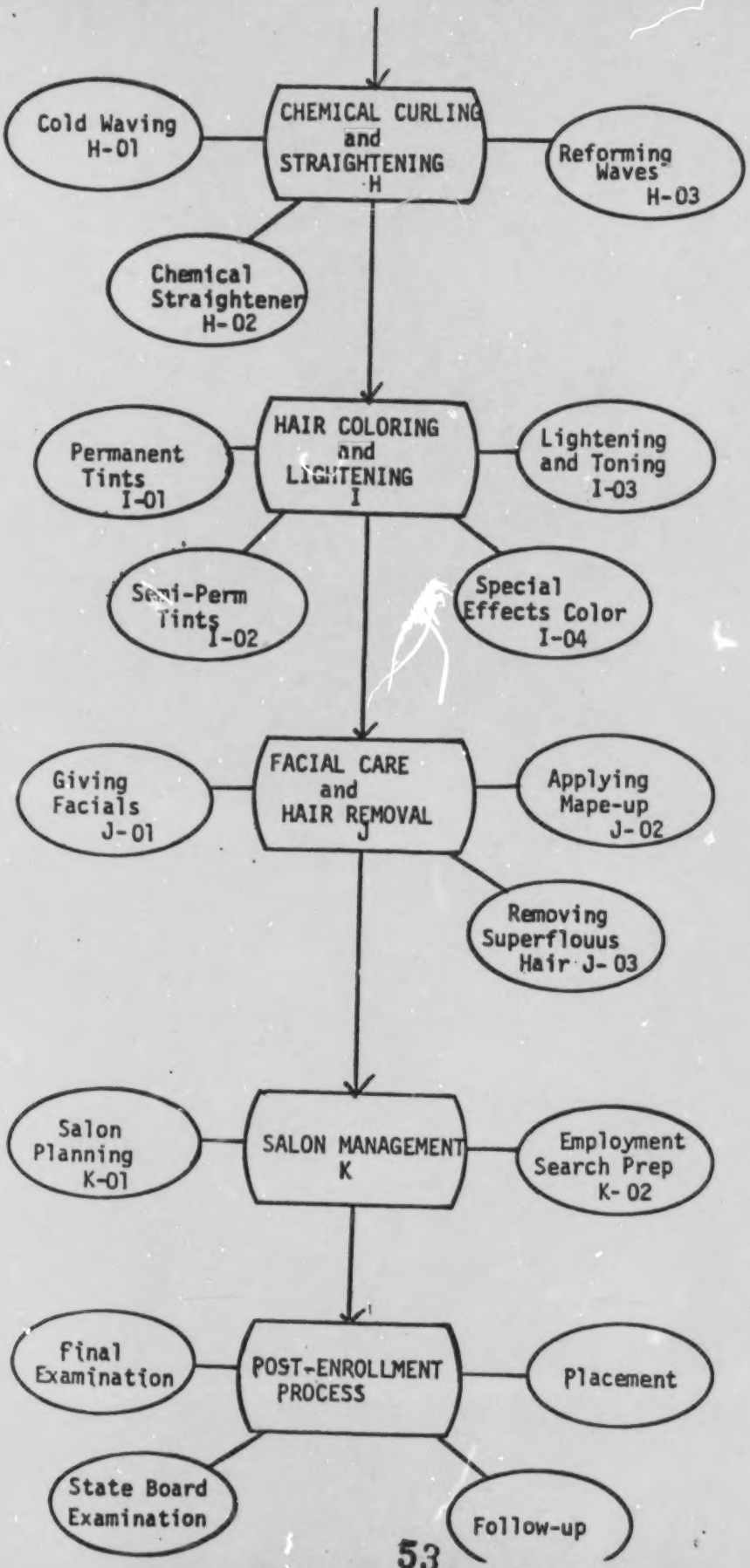
A continuation of the Competency-based Cosmetology Program with emphasis on the development of knowledge and skills in shampooing, rinses, hair and scalp treatments, hair styling, hair shaping, cold waving, chemical straightening, hair coloring and lightening, facial care, hair removal, manicuring, pedicuring with minimal performance competency.

COS 0133 **Cosmetology III** **420 Contact Hours**

The final sequence of the Competency-based Cosmetology Program. Continuance of the practice development of skill performance in Cosmetology. Salon planning, employment preparation with minimal competency.


TABE Assessment Testing
PRE-ENROLLMENT PROCESSING
Employer Recommendation
Vocation-Abilities
Committee Recommendation
Intro to CBVE A-01
ORIENTATION A
V.S.O. Activities A-03
Safety Awareness A-02
ETHICS, LAWS, RULES, AND REGULATIONS B
Careers B-01
Sanitation B-03
State Law, Rules and Regulations B-02
Basic Chemistry C-01
CHEMISTRY SKIN AND HAIR C
Structure and Function of Skin C-03
Trichology Hair-Study C-02


SHAMPOOING RINSES AND SCALP TREATMENTS D
Schampooing D-01
Scalp Treatments D-03
Rinses Temporary Color D-02
HAIR STYLING E
Principles of Hair Design E-01
Blow Waving and Heat Styles E-04
Roller Styles E-02
Finger Waving E-05
Three Types of Pin Curls E-3
MANICURING and PEDICURING F
Manicuring F-01
Pedicuring F-02
HAIR SHAPING G
Hair Shaping Implements G-01
Razor Shaping G-03
Scissor Shaping G-02


Cold Waving H-01
CHEMICAL CURLING and STRAIGHTENING H
Reforming Waves H-03
Chemical Straightener H-02
Permanent Tints I-01
HAIR COLORING and LIGHTENING I
Lightening and Toning I-03
Semi-Perm Tints I-02
Special Effects Color I-04
Giving Facials J-01
FACIAL CARE and HAIR REMOVAL J
Applying Mape-up J-02
Removing Superflouus Hair J-03
Salon Planning K-01
SALON MANAGEMENT K
Employment Search Prep K-02
Final Examination
POST-ENROLLMENT PROCESS
Placement
State Board Examination
Follow-up

SANTA FE COMMUNITY COLLEGE | COSMETOLOGY | PRE-ENROLLMENT PROCESSING

BEGINNING LEVEL

ompetency - What should the tudent know (basic skills) in rder to have a successful earning experience?	Rationale - Why is the entry level competency needed?	Program Competency - How is this competency related to the program and/or world of work?	Evaluation - How will the student be tested to indicat he/she has reached the competency desired?
0th grade reading level	The Professional Cosmetologist 2nd. Ed. Publisher - West	The student must be able to read and understand the textbooks and manufacturer's directions.	Test of Adult Basic Education
ath: 7th-8th grade level. ddition, subtraction, multi-lication, and division of hole numbers, including basic background in ractions and decimals	To keep individual records of hours and services by being able to add and subtract	To add daily sales receipts in order to know earnings. To be able to order supplies and calculate prices. To be able to measure ingredients in mixing chemicals used in their field.	TABE 7th-8th grade level on Mathematics Section
o be able to express thoughts learly in writing	To take written exam which is required in the course	To be able to express oneself on paper when solving test questions, and to be able to write clearly on the state board examination	By filling out application forms for program
Communicate clearly	To communicate with instructor and patron	To be able to express oneself verbally to salon owner or manager, patron, instructor, and co-workers	Personal interview with Advisory Committee Member
nployability Skills	To form work and safety habits required for job entry.	Daily responsibilities in attendance and assigned duties.	Employer-Teacher Recommendation

BEGINNING LEVEL

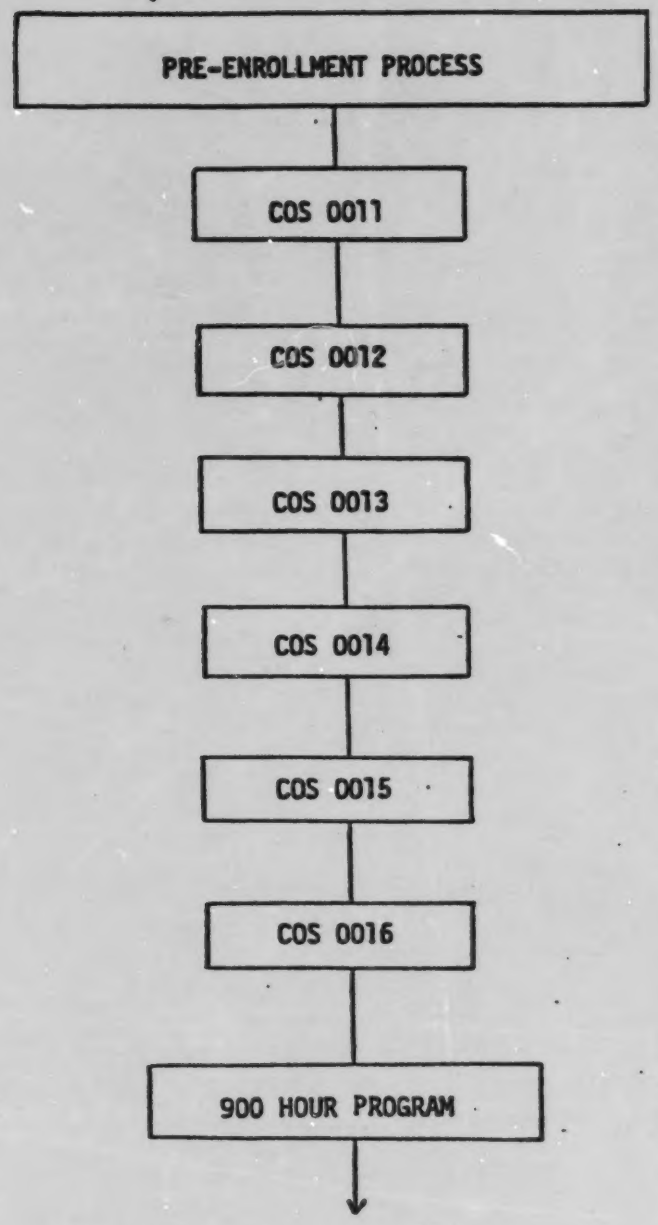
Competency - What should the student know (basic skills) in order to have a successful learning experience?	Rationale - Why is the entry level competency needed?	Program Competency - How is this competency related to the program and/or wold of work?	Evaluation - How will the student be tested to indica he/she has reached the competency desired?
inger Dexterity and Manual xterity	To be able to roll hair and control fingers and hands in order to learn techniques of the profession	By applying learned techniques when pin curling, rolling, hair cutting, permanent waving, chemical relaxing, massaging, filling or painting nails, hair coloring and bleaching, and shaping and molding.	Work evaluation Assessment of abilities Equipment SINGER, GRAPLEX TOWER SYSTEM JEVS SYSTEM WREST SYSTEM
tistic Sense	To be able to determine line, color, and proportion in hair arrangement	To better serve the desire of patron by designing hairstyle or make-up to face shape and body composition	
orm Perception	To make usual evaluations in order to cut, style, apply make-up, arch eyebrows, tint, bleach, and shape nails to the individual	To be able to apply visual evaluation in hair cutting, styling, make-up, arches, tints, bleaches, and shaping the nails during program and in field of work	
otor Coordination	Coordination of eyes, hands and fingers in order to cut, wave, curl, apply tint and bleach, and to execute facials, eyebrow arches, and manicure nails	In order to perform salon services such as cutting, waving, curling, tinting, bleaching, facials, eyebrow arching, manicuring on the job and throughout the program	

COSMETOLOGY

Program Task Listing

TASK	HOURS	
A	20	ORIENTATION
1)	7	Introduction to CBVE
2)	3	Developing Good Work Habits and Safety Awareness
3)	10	Classroom and Laboratory Procedures
B	40	ETHICS, FLORIDA COSMETOLOGY LAW AND RULES AND REGULATIONS
1)	5	Career Prerequisites in Cosmetology
2)	20	State Law, Rules and Regulations
3)	15	Sanitation
C	50	PRINCIPLES OF CHEMISTRY AND THE STUDY OF THE SKIN AND HAIR
1)	15	Basic Principles of Chemistry
2)	20	Trichology - Hair Study
3)	15	Structure and Function of Skin
	110	SHAMPOOI[illegible]ES, TREATMENT OF THE HAIR AND SCALP
1)	20	Shampooing
2)	15	Rinses, Temporary Color and Instant Conditioners
3)	15	Scalp Treatments
4)	45	Services: Scalp Treatments and Rinses - 60
5)	15	Services: Shampoos - 150
E	275	HAIR STYLING
1)	15	Principles of Hair Design
2)	28	Roller Styles
3)	25	Three Types of Pin Curls
4)	20	Blow Waving and Heat Styles
5)	25	Finger Waving
6)	150	Services: Hair Arranging - 300
F	10	MANICURING AND PEDICURING
1)	7	Manicuring
2)	3	Pedicuring
		Services - 10

TASK	HOURS	
G	95	HAIR SHAPING
1)	5	Hair Shaping Implements
2)	20	Scissor Shaping
3)	15	Razor Shaping
4)	55	Hair Shaping Services - 100
H	315	CHEMICAL CURLING AND STRAIGHTENING
1)	50	Cold Waving
2)	50	Chemical Straighteners
3)	160	Services - 100
4)	15	Reforming Waves
5)	40	Services - 10
I	210	HAIR COLORING AND LIGHTENING
1)	50	Permanent Tints
2)	10	Semi Perm Tints
3)	50	Lightening and Toning
4)	25	Special Effects in Hair Color
5)	75	Hair Color Services - 40
J	65	FACIAL CARE AND HAIR REMOVAL
	T5	Giving Facials
2)	10	Applying Make-up
3)	20	Removing Superfluous Hair
4)	20	Services - 20
K	10	SALON MANAGEMENT
1)	5	Salon Planning
2)	5	Employment Search Preparation


PRE-ENROLLMENT PROCESS
COS 0011
COS 0012
COS 0013
COS 0014
COS 0015
COS 0016
900 HOUR PROGRAM

COURSE DESCRIPTION
COSMETOLOGY

COS 0011 Cosmetology I - 40 Contact hours
Introduction to Competency-based Cosmetology, Orientation, Cosmetology Law, Rules and Regulations, Classroom and Laboratory Procedures, Ethics, Sanitation, Career Prerequisits in Cosmetology.

COS 0012 Cosmetology II - 130 Contact hours
Principles of Chemistry and the Study of the Skin and Hair. Basic Principles of Chemistry, Trichology-Study of hair. Structure and functions of the skin. Shampooing, Rinses, Temporary Color and instant conditioners, Scalp treatment.

COS 0013 Cosmetology III - 205 Contact hours
Hair styling - Principles of Hair Design. Roller Styles, Types of Pin curles, Blow waving heat styles, Finger waving and Hair arranging.

COS 0014 Cosmetology IV - 70 Contact hours
Manicuring, Pedicuring and Hair Shaping Composition of nails, growth of nails, parts of nails. Hair shaping implement, Scissor shaping and Razor shaping.

COS 0015 Cosmetology V - 270 Contact hours
Chemical Curling and Straightening Cold Waving - Hair Sectioning, winding, wrapping, Permanent waving and corrective treatment. Chemical straighteners, Reforming waives.

COS 0016 Cosmetology VI - 155 Contact hours
Hair Coloring and Straightening, Permanent Tints, Semi Perm Tints, Lightening and Ioning. Bleach Touch-ups, Tint touch-ups, Chemistry of Bleachers and Tints. Procedure, Facial Care and Hir Removal, Giving facials, Applying makeup, massage, arching eyebrows. Final sequence of the Competency-based Cosmetology Program, Continuance of practice of skills and performance in Cosmetology Salon planning and Employment.

BEST COPY AVAILABLE

SANTA FE COMMUNITY COLLEGE | COSMETOLOGY | PRE-ENROLLMENT PROCESSING

BEGINNING LEVEL

Competency - What should the student know (basic skills) in order to have a successful learning experience?	Rationale - Why is the entry level competency needed?	Program Competency - How is this competency related to the program and/or world of work?	Evaluation - How will the student be tested to indicate he/she has reached the competency desired?
0th grade reading level	The Professional Cosmetologist 2nd. Ed. Publisher - West	The student must be able to read and understand the textbooks and manufacturer's directions.	Test of Adult Basic Education
ath: 7th-8th grade level. ddition, subtraction, multi-lication, and division of hole numbers, including basic background in ractions and decimals	To keep individual records of hours and services by being able to add and subtract	To add daily sales receipts in order to know earnings. To be able to order supplies and calculate prices. To be able to measure ingredients in mixing chemicals used in their field.	TABE 7th-8th grade level on Mathematics Section
o be able to express thoughts learly in writing	To take written exam which is required in the course	To be able to express oneself on paper when solving test questions, and to be able to write clearly on the state board examination	By filling out application forms for program
Communicate clearly	To communicate with instructor and patron	To be able to express oneself verbally to salon owner or manager, patron, instructor, and co-workers	Personal interview with Advisory Committee Member
nployability Skills	To form work and safety habits required for job entry.	Daily responsibilities in attendance and assigned duties.	Employer-Teacher Recommendation

BEGINNING LEVEL

Competency - What should the student know (basic skills) in order to have a successful learning experience?	Rationale - Why is the entry level competency needed?	Program Competency - How is this competency related to the program and/or wold of work?	Evaluation - How will the student be tested to indica he/she has reached the competency desired?
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rtistic Sense	To be able to determine line, color, and proportion in hair arrangement	To better serve the desire of patron by designing hairstyle or make-up to face shape and body composition	
orm Perception	To make usual evaluations in order to cut, style, apply make-up, arch eyebrows, tint, bleach, and shape nails to the individual	To be able to apply visual evaluation in hair cutting, styling, make-up, arches, tints, bleaches, and shaping the nails during program and in field of work	
otor Coordination	Coordination of eyes, hands and fingers in order to cut, wave, curl, apply tint and bleach, and to execute facials, eyebrow arches, and manicure nails	In order to perform salon services such as cutting, waving, curling, tinting, bleaching, facials, eyebrow arching, manicuring on the job and throughout the program	

COSMETOLOGY

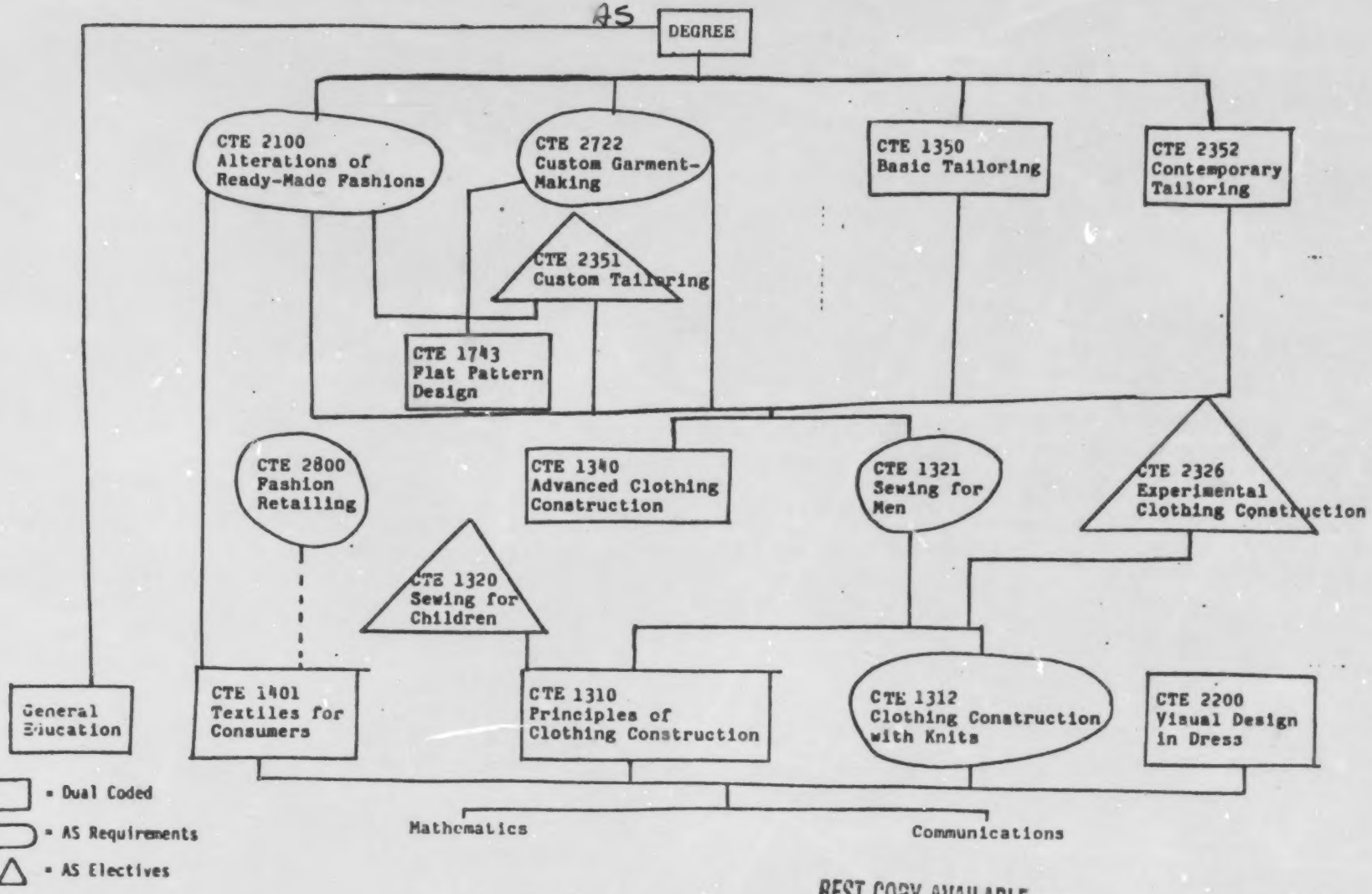
SECONDARY 900 HOURS PROGRAM

Program Task Listing

TASK	HOURS	
A	20	ORIENTATION
1)	7	Introduction to CBVE
2)	3	Developing Good Work Habits and Safety Awareness
3)	10	Classroom and Laboratory Procedures
B	20	ETHICS AND SANITATION
1)	5	Career Prerequisits in Cosmetology
2)	15	Sanitation
C	50	PRINCIPLES OF CHEMISTRY AND THE STUDY OF THE SKIN AND HAIR
1)	15	Basic Principles of Chemistry
2)	20	Trichology - Hair Study
3)	15	Structure and Function of Skin
D	80	SHAMPOOING, RINSES, TREATMENT OF THE HAIR AND SCALP
1)	20	Shampooing
2)	15	Rinses, Temporary Color and Instant Conditioners
3)	15	Scalp Treatments
4)	20	Services: Scalp Treatments and Rinses - 30
5)	10	Services: Shampoos - 100
E	205	HAIR STYLING
1)	15	Principles of Hair Design
2)	20	Roller Styles
3)	25	Three Types of Pin Curls
4)	20	Blow Waving and Heat Styles
5)	25	Finger Waving
6)	100	Services: Hair Arranging - 200
F	10	MANICURING AND PEDICURING
1)	7	Manicuring
2)	3	Pedicuring
		Services - 10
G	60	HAIR SHAPING
1)	5	Hair Shaping Implements
2)	20	Scissor Shaping
3)	15	Razor Shaping
4)	20	Hair Shaping Services - 35

ASK	HOURS	
H	270	CHEMICAL CURLING AND STRAIGHTENING
1)	50	Cold Waving
2)	50	Chemical Straighteners
3)	123	Services: 50
4)	15	Reforming Waves
5)	32	Services: 8
I	155	HAIR COLORING AND LIGHTENING
1)	50	Permanent Tints
2)	10	Semi Perm Tints
3)	50	Lightening and Toning
4)	45	Hair Color Services - 26
J	30	FACIAL CARE AND HAIR REMOVAL
1)	15	Giving Facials
2)	10	Applying Make-up
3)	5	Services - 7

CLOTHING PRODUCTION AND FASHION MERCHANDISING



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CLOTHING PRODUCTION & FASHION MERCHANDISING PROGRAM

Entrance Competencies:

1. Basic Arithmetic Operations
2. Use of Formulas
3. Measurement and Measuring Instruments

Exit Competencies:

1. Arithmetic and the Hand-Held Calculator
2. Metric System
3. Percentages

CLOTHING PRODUCTION AND FASHION MERCHANDISING

CTE 1310 PRINCIPLES OF CLOTHING CONSTRUCTION 4 D

Acquaints the student with equipment and develops basic techniques and competencies in construction, pattern selection, and alterations.

CTE 1312 CLOTHING CONSTRUCTION WITH KNITS 4 O

Students develop skills and competencies using a variety of types of knits as single, double, tricot, and two-way stretch.

CTE 1320 SEWING FOR CHILDREN 4 O

This course is designed for the person who has no previous experience sewing for children. Students will become acquainted with measurements and types of patterns available for children. Construction techniques most often found in children's wear will be covered.

CTE 1321 SEWING FOR MEN 4 O

This course is designed for the person who has no experience sewing men's fashions. Students will become acquainted with measurements and types of patterns available for men. Sewing techniques most often used in men's wear will be covered.

CTE 1340 ADVANCED CLOTHING CONSTRUCTION 4 D

Emphasis on advanced techniques using a Vogue pattern with special emphasis on more difficult fabrics.

CTE 1350 BASIC TAILORING 4 D

This course is designed to provide opportunities for students to prepare for entry-level employment in the clothing industry. Steps and processes are presented in sequence in making a contemporary tailored garment, using up-to-date methods that make tailoring a quicker process.

CTE 1401 TEXTILES FOR CONSUMERS 4 D

Analysis of fabric, fibers, and yarns. A consumer-oriented course. Learn to identify various fibers studying their construction, use, and care.

CTE 1743 FLAT PATTERN DESIGN 4 D

Flat patternmaking. Use of the basic pattern in designing ladie's and children's clothing. Includes bodices, sleeves, collars, facings, and skirts.

CTE 2100 ALTERATIONS OF READY-MADE FASHIONS 4 O

This course is designed to provide students with the opportunity to acquire knowledge and develop skills needed for performance as alterations specialists for a fitter for ready-made garments. Opportunities are provided for students to develop skills in re-designing, re-cutting, and major and minor alterations on ready-made garments.

CTE 2200 VISUAL DESIGN IN DRESS 3 D

A study of line, form, space, color, and texture in the selection of clothing for the individual. The development of judgement in ensembling and wardrobe planning for various occasions, occupations, and age groups.

CTE 2326 EXPERIMENTAL CLOTHING CONSTRUCTION 4 D

A course for the experienced sewer that will further knowledge and promote confidence in finding many ways of doing different sewing techniques. The student will be encouraged to experiment to find the best method for him. Time studies and new techniques will be included.

CTE 2351 CUSTOM TAILORING 4 O

This course is designed to provide laboratory and field experiences for students to develop skills which will prepare them for self-employment in a tailoring occupation.

CTE 2352 CONTEMPORARY TAILORING 4 D

An application of tailoring techniques commercially used in the production of coats and jackets using a commercial pattern. Speed techniques and new products are emphasized. It is recommended the participant has acquired basic construction techniques and knowledge of basic sewing equipment.

CTE 2722 CUSTOM GARMENT MAKING 4 O

This course is designed for the advanced clothing and design major, giving them experience in sewing for others. The student will use techniques learned in textiles, flat pattern design, and clothing construction to construct a garment for two people. The student will develop a pricing system functional for the student as well as the client.

CTE 2800 FASHION RETAILING 3 O

Prepares students for employment in the clothing and design related areas and should be taken the last semester on campus.

LEARNING OUTCOMES

Principles of Clothing Construction

1. Using lab equipment provided, the student will demonstrate the use, care and maintenance of equipment by daily exhibiting good habits and care.
2. Given half scale patterns, the student will determine the need for and perform basic pattern alterations as determined by their body measurements with 70% accuracy.
3. The student will determine and select fabric for basic clothing construction according to characteristics, fiber and individual projects as determined by pattern selection.
4. Given a sampler pattern, the student will identify pattern parts with 70% accuracy.
5. The student will construct basic garments with 70% accuracy.
6. Using fabric and notions provided, the student will perform basic construction tasks with 70% accuracy.

Clothing Construction with Knits

1. The student will analyze various knit fabrics for ease of maintenance, use, and construction with 100% accuracy.
2. The student will apply correct methods and techniques in the selection, construction and application of notions and interfacings to an individually constructed knit garment with 70% accuracy.
3. The student will apply proper methods and techniques in the operation of a sewing machine for construction of specialized knit fabrics with 70% accuracy.

Sewing for Children

1. The student will examine styles in childrens' wear as suggested by a shopping guide with a 100% completion.
2. The student will apply correct methods and techniques in taking body measurements of children as established by a class handout.
3. The student will apply proper methods in selecting fabrics and notions for the construction of an individual child's garment.
4. The student will apply correct methods and techniques in the application of pattern alteration of childrens' patterns, with a 70% accuracy.
5. The student will analyze the final projects for quality of work and fit with 70% accuracy.

LEARNING OUTCOMES

Sewing for Men

1. The student will apply correct methods and techniques taking body measurements and selection of a pattern for men.
2. The student will apply proper methods in selecting fabrics and notions to use in men's wear construction with 90% accuracy.
3. The student will apply the correct methods and techniques in the application of pattern alterations with 70% accuracy.
4. The student will perform special construction techniques on a man's shirt and slacks with 70% accuracy.

Advanced Clothing Construction

1. Using half scale patterns, the student will demonstrate advanced alteration techniques with 70% accuracy.
2. The student will select appropriate fabric with specific end uses as determined by pattern selection.
3. The student will apply advanced construction techniques on advanced garments with 70% accuracy.
4. Using plaid and napped fabrics, the student will demonstrate a knowledge of cutting and sewing these fabrics with 90% accuracy.

Basic Tailoring

1. The student will choose a pattern with given criteria for tailoring a jacket or coat.
2. The student will select a fabric appropriate to a specific tailored garment as determined by the text and instructor.
3. The student will apply standard rules for pre-treating fashion fabrics as well as supporting fabrics before beginning construction.
4. The student will apply tailoring construction techniques for a complete tailored garment with 70% accuracy.

LEARNING OBJECTIVES

Textiles for Consumers

1. Given sample yarns, the student will be able to identify the fibers with 70% accuracy.
2. The student will be able to describe the characteristics of fibers with 70% accuracy.
3. The student will be able to describe the process of converting fibers to yarns with 70% accuracy.
4. The student will be able to explain basic finish processes with 70% accuracy.
5. The student will demonstrate an understanding of labeling and legislation in effectively writing a letter of complaint explaining legislation, environmental protection, or consumer rights.

Flat Pattern Design

1. The student will analyze and identify individual figure problems evaluated by basic muslin sloper.
2. The student will select, use and maintain pattern drafting equipment and supplies in order to perform daily class assignments.
3. The student will design a sloper from a basic commercial pattern with 90% accuracy.
4. The student will create designs and changes in designs by manipulation of darts, creating collars, manipulating sleeve and skirts with a 70% accuracy.
5. The student will create, construct and evaluate an original design from fashion fabric with 70% accuracy.

Alterations of Ready Made Fashions

1. The student will be able to identify terminology and issues revelant to the garment industry with 70% accuracy.
2. The student will demonstrate the ability to identify stains and effectively remove them.
3. The student will effectively fit a given range of garment types and evaluate a variety of garments for fitting with a 70% accuracy.
4. The student will demonstrate the correct techniques in performing basic alterations with 70% accuracy.

LEARNING OUTCOMES

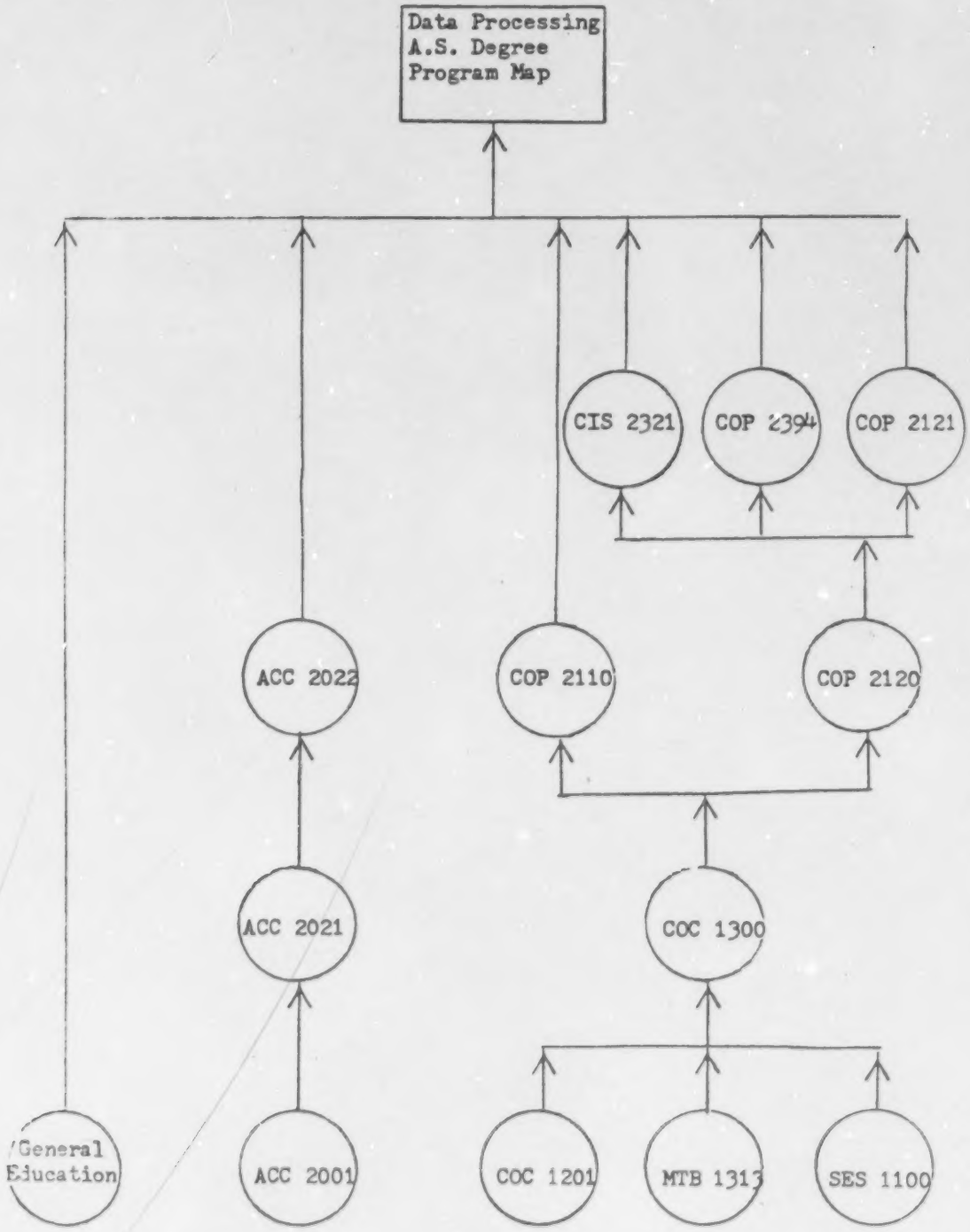
Visual Design in Dress

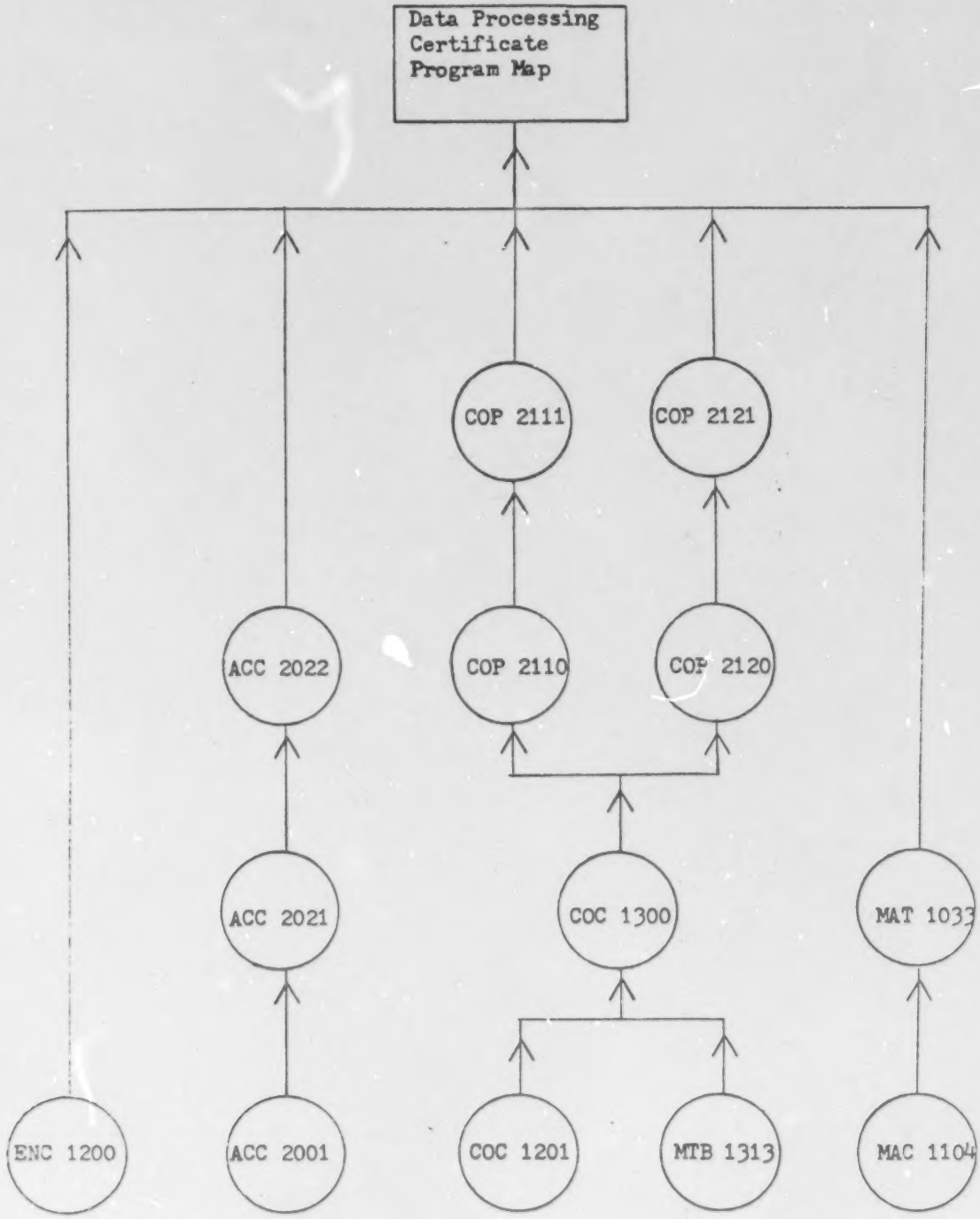
1. The student will be able to state various reasons for wearing selected clothing with 70% accuracy.
2. The student will examine physical influences and explain how they affect apparel selection with 70% accuracy.
3. The student will define art principles and explain how they influence apparel selection with 70% accuracy.
4. The student will explain how designs are applied to clothing appearance and affect apparel selection with 70% accuracy.
5. The student will demonstrate how principles of design are applied to clothing appearance and affect apparel selection with 70% accuracy.

Contemporary Tailoring

1. The student will analyze traditional and contemporary tailoring techniques with a 70% accuracy.
2. The student will compare traditional tailoring equipment with contemporary techniques with 70% accuracy.
3. The student will select fabric pattern and support fabrics for a contemporary tailored garment.
4. The student will construct a contemporary jacket with 70% accuracy.

DATA PROCESSING


Data Processing
A.S. Degree
Program Map
CIS 2321
COP 2394
COP 2121
ACC 2022
COP 2110
COP 2120
ACC 2021
COC 1300
General
Education
ACC 2001
COC 1201
MTB 1313
SES 1100


Data Processing
Certificate
Program Map
COP 2111
COP 2121
ACC 2022
COP 2110
COP 2120
ACC 2021
COC 1300
MAT 1033
ENC 1200
ACC 2001
COC 1201
MTB 1313
MAC 1104

PROGRAM MAP LEGEND

ACC 2001 Principles of Accounting I

ACC 2021 Principles of Accounting II

COP 2394 Online (CICS) Programming

CIS 2321 Systems Analysis Techniques

COC 1201 Introduction To Data Processing

COC 1300 Computer Concepts

COP 2110 FORTRAN Programming

COP 2120 COBOL Programming

COP 2121 Advanced COBOL Programming

MTB 1313 Data Processing Mathematics

SES 1100 Elementery Typewriting

ACC 2022 Principles of Accounting III

ENC 1200 Business Writing

MAT 1033 Intermediate Algebra

MAC College Algebra

COP 2111 Advanced FORTRAN Programming

DATA PROCESSING

CIS 2321 SYSTEMS ANALYSIS TECHNIQUES 3 D

The basic systems techniques of systems analysis will be studied and their methods applied to the development of a hypothetical business system. Prerequisite: COP 2120 or Data Processing experience.

COC 1201 COMPUTER CONCEPTS I 3 D

Introduction to the commercial uses of data processing in businesses today. Students progress through a planned sequence of units concerning basic systems design, development of required skills, data processing equipment, and basic programming concepts as well as job opportunities in Alachua County and surrounding areas.

COC 1300 COMPUTER CONCEPTS II 3 D

Introduction to basic computer program design. This course provides students with extensive "hands-on" experience in operating the colleges's computing system as well as an introduction to such programming languages as COBOL, FORTRAN, and RPG.
Prerequisite: COC 1201 Computer Concepts I

COP 1170 PROGRAMMING IN BASIC 3 D

An introductory course in BASIC Microcomputer programming which will guide the student through a planned series of "hands-on" competency based units utilizing the latest microcomputer system techniques.

COP 2110 FORTRAN PROGRAMMING 3 D

Class lectures and programming assignments provide introductory exposure to the FORTRAN language. A college preparatory course for those students entering engineering or the sciences and intending to continue their training at the university level. Prerequisite: COC 1201 Computer Concepts I

COP 2111 ADVANCED FORTRAN PROGRAMMING 3 D

A continuation of the first FORTRAN course requiring students to independently complete fifteen programming assignments designed to increase familiarity and expert ise in the FORTRAN language. Prerequisite: COP 2110 FORTRAN Programming.

COP 2120 COBOL PROGRAMMING 3 D

This course assumes a student's ability to program in at least one other language. Topics cover COBOL syntax and the development of structured programs according to commercially acceptable standards. Prerequisite: COC 1300 or business experience in the data processing-related environment.

COP 2121 ADVANCED COBOL PROGRAMMING 3 D

Class lectures and extensive experience provide students programming skills and familiarity with structured system design and implementation. Topics include structured programming theory, top-down systems, development, team operations, and the development control of multi-file processing systems in the COBOL language. Prerequisite: COP 2120 or experience in a commercial COBOL programming environment.

COP 2160 RPG COMPUTER PROGRAMMING 3 D

Introduction to the structure and use of the RPG I and II programming language, an easy to learn, problem oriented language used in business data processing. Prerequisite: COC 1300.

COP 2394 ONLINE PROGRAMMING (CICS) 3 D

Terminology, hardware, software, logic, and programming of a modern on-line programming system. Unique online data processing techniques will be examined and skills learned to produce programs which Inquire, Update, and Page files. This course uses the CCICS/VS Command (COBOL) Programming Language plus Basic Mapping support. The environment is DOS/VSE with VSAM disk access method and IBM's 3270 Simulator. Prerequisite: COP 2120.

MTB 1313 DATA PROCESSING MATH 3 D

Fifteen units covering math concepts needed by individuals expecting to pursue careers in commercial data processing. Topics include: set theory, algorithm design, number systems, and Boolen algebra.

SES 1100 ELEMENTARY TYPEWRITING 3 D

Fundamental techniques in touch typewriting for those who have never had a course in typewriting before, or who do not have sufficient skills to enter Intermediate typewriting.

ACC 2001	PRINCIPLES OF ACCOUNTING I	3	D

Sole proprietorship accounting through the completion of the accounting cycle, including general journals and ledgers, special journals and ledgers, worksheets, financial statements, inventories, promissory notes, internal control, and payroll systems.

ACC 2021	PRINCIPLES OF ACCOUNTING II	3	D

Partnership and corporation accounting including deferrals and accurals, depreciation, amortization, depletion, stocks, dividends, bonds, departments and branches, and not-for-profit accounting. Prerequisite: ACC 2001

ACC 2022	PRINCIPLES OF ACCOUNTING III	3	D

This course is designed as the third part of a financial-managerial sequence. The primary emphasis is on the use of accounting information by managers in making decisions. Thus, the student can see how the management accountant and his/her work assume a key role in the administration of modern enterprises. This course also includes chapters on cost accounting, which provides a very helpful background for studying certain managerial uses of cost data. Prerequisite: ACC 2021.

** SFCC DATA PROCESSING PROGRAM **

The Sante Fe Community College Data Processing Program is a two year sixty hour program that leads to an associate of science degree. Students sucessfuly completing the program will have developed skills in general business, data processing, computer programming, and general communications needed for entry to a career in computer data processing. The student will leave the program with the necessary qualifications for entry level positions as a computer programmer. A foundation will have also been formed for a student to advance to the level of analyst after experience in the field, or to be able to continue pursuing a higher degree in computer science.

The following course outline has been presented to the Data Processing Advisory Committee. They have approved the course sequence and the below listed objectives of the course offerings.

GENERAL EDUCATION REQUIREMENTS

1.	Communications/Humanities		6 Hours
	a. ENC 1101 College Composition	3	
	b. ENC 1200 Business Writing	3	
2.	Mathematics		6 Hours
	a. MAC 1104 College Algebra	3	
	b. MAT 1033 Intermediate Algebra	3	
3.	Social/Behavioral		6 Hours
	a. ECO 1000 Basic Economics	3	
	b. Social/Behavioral Elective	3	

CAREER CORE REQUIREMENTS

ACC 2001	Principles of Accounting I	3
ACC 2021	Principles of Accounting II	3
COP 2394	Online (CICS) Programming	3
CIS 2321	Systems Analysis Techniques	3
COC 1201	Introduction to Data Processing	3
COC 1300	Computer Concepts	3
COP 2110	FORTRAN Programming	3
COP 2120	COBOL Programming	3
COP 2121	Advanced COBOL Programming	3
MTB 1313	Data Processing Mathematics	3
SES 1100	Elementary Typewriting or demonstration of 35 WPM	3
	Business Electives	9

Program objectives

Students successfully completing the data processing program will be able to:

1. Define data processing terms
2. Identify parts of the data processing cycle
3. List four main functions of data processing hardware
4. Write computer programs in FORTRAN, COBOL, and HYPO Assembler

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5. Define general business accounting terms
6. Analyze business proceedures for computer applications development
7. Read and convert hexadecimal memory dumps to binary representation
8. Convert decimal, octal, hexadecimal, and binary numbers
9. Write CICS procedures based on COBOL

Data Processing Course Objectives

he following objectives are from course modules currently being sed. Assignments are matched to objectives. For the sake of onciseness the objectives will be presented here with some examples f modules taken from the Introduction to Data Processing course.

OC 1201 Intoduction to Data Processing
Define terms used in data processing
List applications
Trace the history of data processing machinery as they have evolved since 1780 to the present
Describe major computer hardware components and their function
Describe the five steps involved in computer problem solving
Identify the four program logic patterns
Draw a logic flowchart to solve a programming problem
Discuss the characteristics of assembly language, COBOL, FORTRAN, PL/1,RGP, BASIC, APL, and PASCAL
Evaluate different programming languages for their advantages and disadvantages
Distinguish between main frame, maxicomputers, minicomputers and micocomputer systems
Discuss computer industry problems involving security, privacy, and individual rights concerning centralized information
Describe a word processor system, forms of electronic mail, reprographics, and other future effects of computers in our lives
List at least ten career opportunities in Data Processing

COC 1300 Computer Concepts
Explain the functions of the four components of a computer system
List the four basic programming instructions that apply to every computer
Demonstrate accessing data by direct hard address
List the HYPO instruction set and the function of each instruction
List the job control language (JCL) commands
Demonstrate how an assembly program package is compiled
Run HYPO programs to solve simulated problems
Draw usable program flowcharts
Differentiate between stored programs, stored data, and literal constants
Run prepared FORTRAN and COBOL programs

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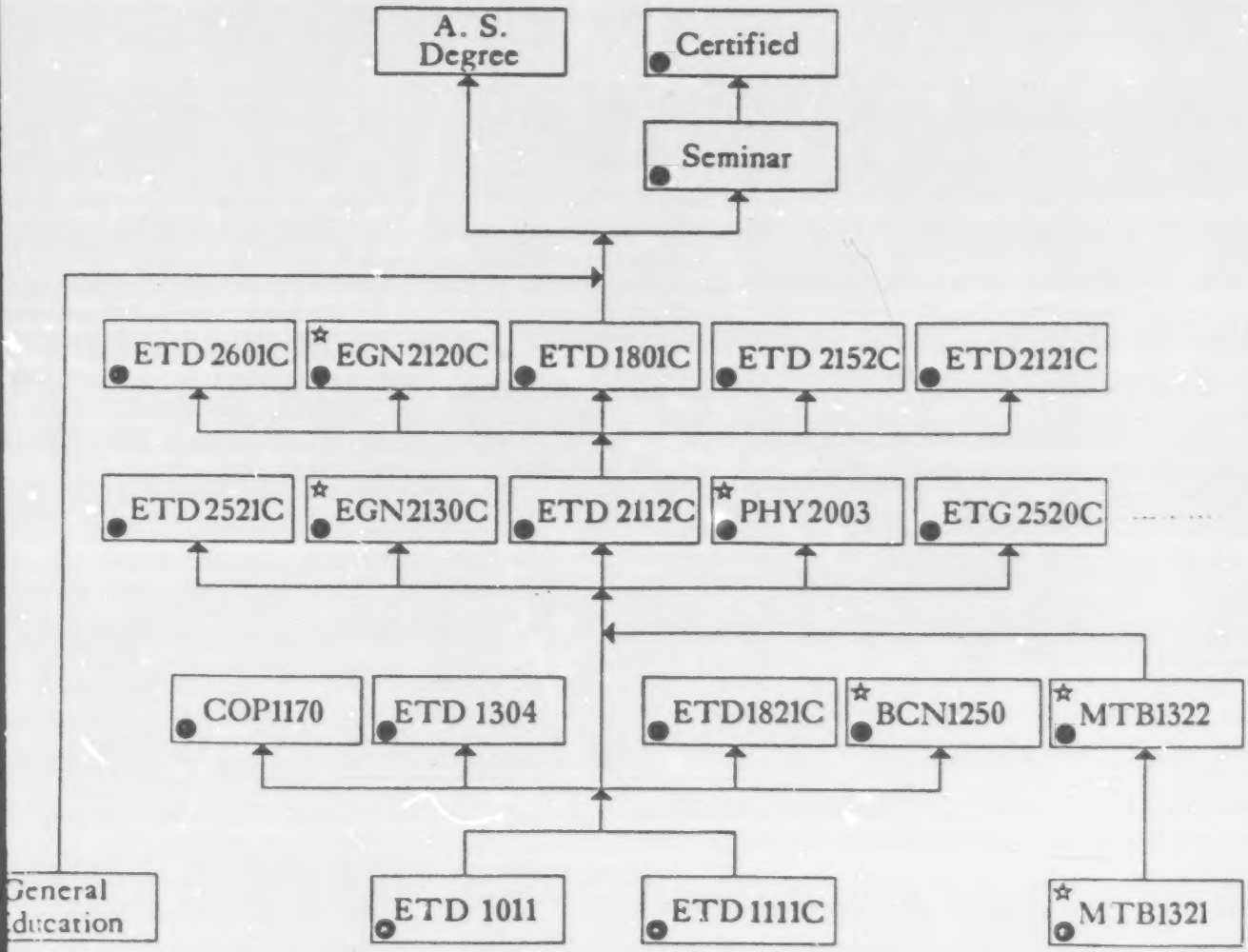
DRAFTING TECHNOLOGY

Associate In Science Degree

DRAFTING TECHNOLOGY



● A.S. Program

☆ Dual Program

DRAFTING TECHNOLOGY

Entrance Skills

The English Department will measure these skills. The entrance requirement is a tenth grade level.

The mathematical skills are set at a tenth grade level. The examinations are four tests from the Comparative Guidance and Placement Program of the College Board. The titles are:

Elementary Arithmetic Placement Test
Applied Arithmetic Placement Test
Elementary Algebra Placement Test
Intermediate Algebra Placement Test

In addition, the applicant will continue to take the mathematics test used by the Technical Education department to determine entry-level into the mathematics component of the program. When correlation has been established between the two sets of tests, the placement tests will determine entry-level.

Entrance Competencies:

1. Basic Arithmetic Operations
2. Arithmetic and the Hand-Held Calculator
3. Ratio, Proportion, and Variations
4. Measurement and Measuring Instruments
5. Fundamentals of Algebra
6. Powers and Roots
7. Use of Formulas

Exit Competencies:

1. Algebra
2. Geometry; plane and solid
3. Trigonometry
4. Functions and Graphs
5. Statistics
6. Exponential and Logarithmic Functions
7. Vectors

DRAFTING TECHNOLOGY

Fall Entrance

First Year - First Semester (Fall)		Credits
ETD 1012	Blueprint Reading	3
ETD 1111C	Drafting I	3
MTB 1321	Math for Technicians I	3
ENC 1101	College Composition	3
SSI 1010	The Social Sciences	
	or	3
POS 2112	State & Local Government	
		15

First Year - Second Semester (Winter)		
ETD 1821C	Drafting II	3
MTB 1322	Math for Technicians II	3
BCN 1250	Architectural Graphics	3
COP 1170	Programming in BASIC	3
ETD 1304	Microcomputer Applications for Engineering	3
		15

First Year - Third Semester (Spring/Summer)		
ECO 2013	Principles of Economics	3
HUM 1020	Introduction to Humanities	4
		7

Second Year - First Semester (Fall)		
ETG 2520C	Statics & Strength of Materials	3
PHY 2003 & Lab	Applied Physics	4
ETD 2112C	Drafting III	3
EGN 2130C	Engineering Graphics I	3
ETD 2521C	Industrial Drafting	3
		16

Second Year - Second Semester (Winter)		
ETD 2152C	Structural Drafting	3
EGN 2120C	Engineering Graphics II	3
ETD 1801C	Technical Illustration	3
ETD 2121C	Topographic Design	3
ETD 2601C	Electrical Drafting	3
		15

PROGRAM TOTAL 68 Hours

The above program presumes that the student has taken MAT 1002 or has equivalent preparation PRIOR to the first semester.

MAJOR LEARNING OUTCOMES OF THE COURSES

ETD 1111C DRAFTING I 3 credit hours

Given the problem parameters, the student will develop drawings which demonstrate the application of line types, sheet layout, block lettering, orthographic projection techniques, the use of drafting instruments and materials as well as dimensioning in accordance with acceptable industrial drafting standards.

ETD 1821C DRAFTING II 3 credit hours

Given a multiview drawing and design parameters, the student will develop presentations using isometric and perspective techniques in accordance with acceptable industrial drafting standards.

ETD 2112C DRAFTING III 3 credit hours

Given the problem parameters, the student using acceptable drafting standards, will develop technical drawings in sectioning, threads and fasteners and geometric tolerancing.

ETD 1011 BLUEPRINT READING 3 credit hours

Given a set of working drawings, the student using acceptable drafting principles will be able to visualize the size and shape of the object(s) and interpret lines, symbols, dimensions, notes and other pertinent information necessary for job-entry level communication in industrial work.

EGN 2130C ENGINEERING GRAPHICS I 3 credit hours

Given a drawing showing the necessary primary views, the student will construct the required auxiliary views to illustrate spatial relationships between lines and/or planes in their true size, slope angle and bearing with 100% accuracy.

EGN 2120C ENGINEERING GRAPHICS II 3 credit hours

Given a drawing showing the necessary primary views, the student will construct the required auxiliary views to determine the dihedral angle and intersection and development of lines and/or planes with 100% accuracy. The student will also demonstrate job-entry level skill in using descriptive gemometry principles to solve engineering problems.

ETD 2521C INDUSTRIAL DRAFTING 3 credit hours

Given the problem paramters and design data, the student will develop drawings of piping details, plan and elevation views of piping systems and isometric pictorials of piping systems in accordance with acceptable pipe drafting standards.

MAJOR LEARNING OUTCOMES OF THE PROGRAM

The student graduate of the program, given the parameters of the specific task, can communicate understandably in the vocabulary natural to the drafting profession and can demonstrate job-entry level acceptable skills in:

1. Standard drafting line types and projections
2. Dimensioning methods unique for each discipline
3. Standard drafting lettering styles
4. Organizing and reproducing working drawings
5. Fundamental theories of employable disciplines
6. Developing working drawings in:
   a. Architectural
   b. Civil
   c. Electrical
   d. Mechanical
   e. Structural
7. Mathematics and Social Sciences

TASK LISTING

English Communications

Humanities

Social Sciences

Survey of Physics

General Mathematics

Basic Algebra

Geometry

Trigonometry

Programming in BASIC

Running Blue Prints

Reading Blue Prints

Line Work with Pencil

Line Work with Ink

Line Work with Plastic Leads

Lettering with Pencil

Lettering with Ink

Lettering with Leroy

Lettering (Transfer)

Following Oral Instructions

Following Written Instructions

Works with Supervision

Works without Supervision

Independent Problem Solving

Research

Sketching

Sheet Layout

Geometric Development

Dimensioning

Dimensioning (Metric)

Orthographic Projection (Multiview)

Orthographic Projection (Auxiliary View)

Correcting Check Prints

Isometric Drawing

Dimetric Drawing

Trimetric Drawing

1-Point Perspective

2-Point Perspective

3-Point Perspective

Threads and Fasteners

Sectioning

Tolerancing

Descriptive Geometry

Piping Details

Piping Plans

Piping Elevations

Basic Surveying

Map Drawing

Field Note Interpretation

Contours

Traverses

Curve Data

Property Descriptions

Cut & Fill

Plan & Profile

Quantity Take-offs

Plot Plans

Floor Plans

Wall Sections

Elevation Views

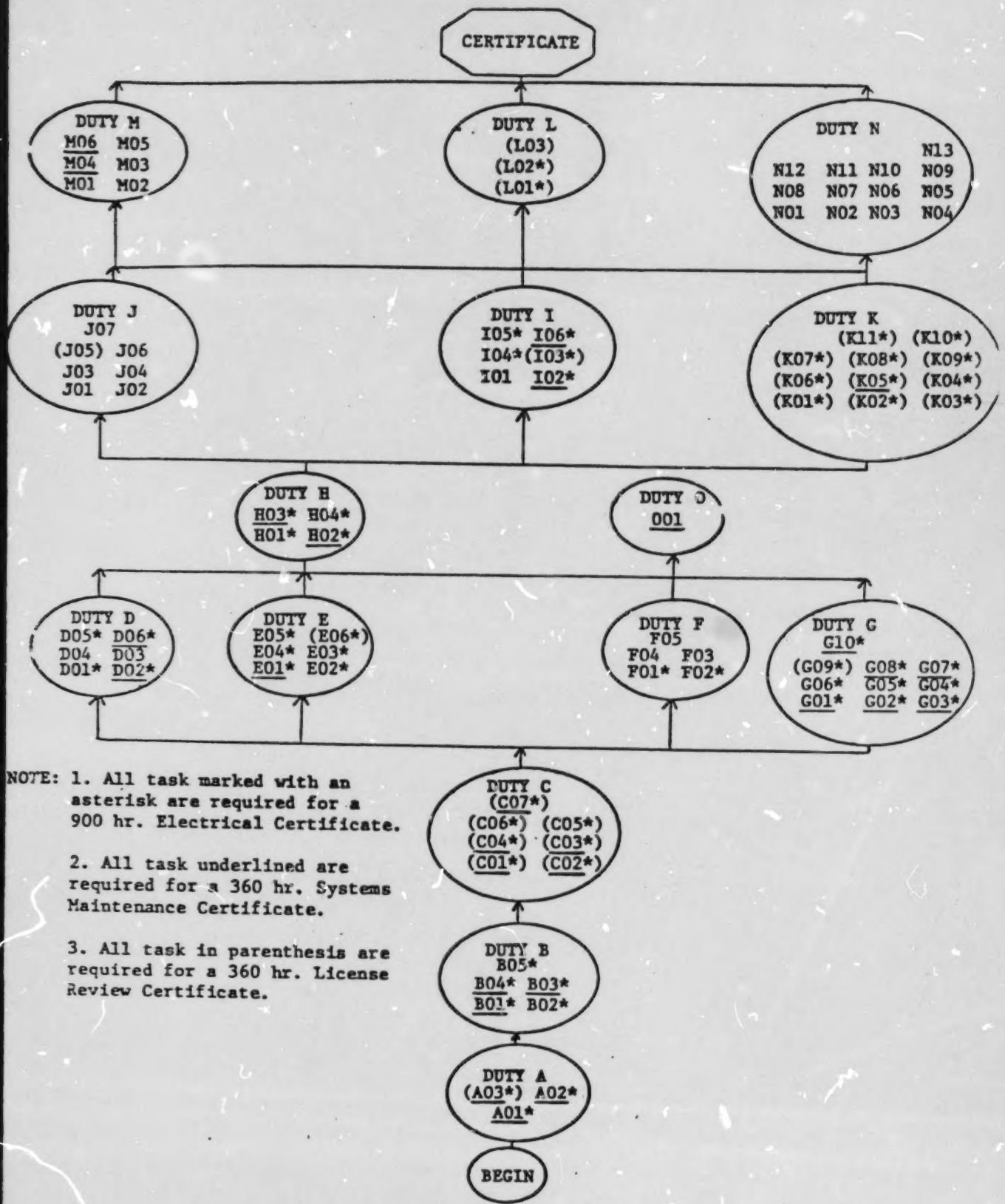
Footings & Foundations

Estimating

Computer-Aided Drafting

ELECTRICAL CONSTRUCTION

ELECTRICAL CONSTRUCTION



NOTE: 1. All task marked with an asterisk are required for a 900 hr. Electrical Certificate.

2. All task underlined are required for a 360 hr. Systems Maintenance Certificate.

3. All task in parenthesis are required for a 360 hr. License Review Certificate.

uties and Tasks are listed on the Task Listing Sheet.

ENTRY-LEVEL COMPETENCIES

COMPETENCY	RATIONALE	PROGRAM COMPETENCY	EVALUATION
Math at minimum 8th grade level. Ability to add, subtract, multiply and divide whole, mixed, fractional and decimal numbers.	To arrive at correct cost estimate and correct discounts and percentages; also maintain personal records.	To be able to evaluate cost of labor and parts, and also calculate his earned percentage.	8th grade level or higher. IMTS Lab Math Survey.
Manipulative skill and manual dexterity.	The work of an Electrician repairman is extremely physical and the use of tools is required. Certain tasks may be hazardous.	The student is required to use hand tools as well as electrical power tools. These tools will be used in this program as well as in industry. He must function without endangering himself or others.	Subjective by instructor. Aptitude testing if indicated.
Physical mobility.	Physical tasks of the Electrician include lifting, moving, bending, and stooping.	Measuring, testing, moving, assembling, installing and repairing electrical equipment safely is required. Climbing of ladders and scaffolding is required.	Determination will be subjective and occur during first 2 weeks of class.
8th grade reading level.	This is the minimum level for code books and references in this program.	The student must be able to read electrical codes, rules, service manuals and safety instructions.	8th grade level or higher on IMTS reading survey.
Clear verbal communication.	The student must communicate with instructor, students and fellow workers.	To communicate verbally with fellow workers and customers.	Instructor observation.
Algebra.	Calculations must be made to determine circuit sizes.	Solve simple equations with one unknown.	IMTS math survey for formulas.

PROGRAM TITLE: Electric Wiring

DOE PROGRAM NUMBER

SCHOOL DISTRICTS: 9303

COMMUNITY COLLEGES: 1.26.1002

PROGRAM OBJECTIVE: This program is designed to enable persons to acquire skills and knowledge necessary for initial employment or to upgrade or retrain persons who are or have been in the work force, and to serve as pre-apprenticeship and apprenticeship related instruction for persons registered with the Bureau of Apprenticeship, State of Florida, under such primary job titles as Electrician.

PROGRAM DESCRIPTION: Specialized classroom and shop/lab experiences are utilized to enable the student to become proficient in the laying out, installation, and maintenance of electrical wiring and related equipment in houses, industrial and commercial establishments, and other structures. Blueprint interpretation, building and wiring codes, specifications and material capacities and limitations are part of the program offerings. The program of instruction also includes: splicing of wires, installation of conduit, connection of wires to circuit breakers, transformers, switches, lighting fixtures and connection of grounding lines. Safe work procedures are taught as well as the testing and troubleshooting of circuits using appropriate instruments and monitoring devices. Employability skills are included. Activities of the Vocational Industrial Clubs of America (VICA) may be included as a part of the instruction. Students from this program may be placed in Industrial Cooperative Education upon attainment of an appropriate level of competence.

BCT 0690 Electrical Construction 90 Contact Hours

A 900 hour course of study in the installation of electrical wiring within residential, commercial, and industrial buildings. This course will include application of safety procedures, electrical codes, electrical theory, and the use of the most common tools used in the industry.

TASK LISTING

Electrical Construction

DATE:

Name: _____ Social Security #: _____

		STD.	TIME	DATE	INST.
DUTY A	APPLYING ORIENTATION AND SHOP PROCEDURES				
Task A01	Demonstrate use of competency base instructional materials				
A02	Orientation and safety in the electrical shop				
A03	Identify shop safety practices				
DUTY B	APPLYING SAFETY PRACTICES				
Task B01	Identify hand tool, power tool and equipment safety				
B02	Identify components of a shop safety program				
B03	Determine OSHA violations				
B04	Identify contributing physical and mental factors to accidents				
B05	Demonstrate use of C.P.R.				
DUTY C	MASTERING BASIC ELECTRICAL FUNDAMENTALS				
Task C01	Explain electron theory and forms of electricity				
C02	Construct and test series and parallel circuits				
C03	Demonstrate application of Ohm's law				
C04	Identify magnetic properties and electromagnetism				
C05	Describe and analyze a.c. circuits				
C06	Calculate impedence in series and parallel a.c. circuits				
C07	Calculate electrical energy and power factor				
DUTY D	MASTERING SOCIOECONOMIC PRINCIPLES				
Task D01	Maintain individual time records				
D02	Take inventory of materials and tools				
D03	Prepare a payroll for one quarter				
D04	Identify direct job cost and overhead expenses				
D05	Identify cost of training journeymen				
D06	Complete job application requirement				
DUTY E	INSTALLING RACEWAYS				
Task E01	Cut and thread pipe using hand and power equipment				
E02	Bend offset and stub-ups in e.m.t.				
E03	Bend 3 and 4 bend saddles in e.m.t.				
E04	Bend concentric 90° bends, offsets & stub ups with hydraulic bender				
E05	Bend P.V.C. conduit				
E06	Identify code requirements for installing raceways				
DUTY F	MASTERING BASIC SOLID-STATE FUNDAMENTALS				
Task F01	Identify solid-state components				
F02	Determine resistor values				
F03	Describe and test rectifiers and semi-conductors				
F04	Work with right triangles and phasors				
F05	Connect electromechanical and solid-state control circuits				
DUTY G	INSTALLING RESIDENTIAL WIRING				
Task G01	Read residential blueprints and lay out electrical requirements				
G02	Install recpt. branch circuits				
G03	Install switch-controlled light and recpt. outlets				
G04	Install special purpose branch circuits				
G05	Install services and service equipment				
G06	Identify requirements for temporary and mobile home services				
G07	Install chime circuits and low voltage lighting controls				
G08	Wire control circuits for air conditioning and heating				
G09	Identify requirements for swimming pool wiring				
G10	Troubleshoot branch circuits				

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		STD	TIME	DATE	INST
DUTY B	INSTALLING COMMERCIAL WIRING				
Task B01	Install branch circuit using metallic raceway				
B02	Install time clock				
B03	Install fluorescent lighting fixtures				
B04	Design grounding system for commercial building				
DUTY I	INSTALLING INDUSTRIAL WIRING				
Task I01	Connect d.c. motor controllers				
I02	Connect 1 phase a.c. motors				
I03	Connect 3 phase a.c. motors				
I04	Make single phase transformer connections				
I05	Make polyphase transformer connections				
I06	Install pressure switch controlling motor through motor controller				
DUTY J	WIRING CONTROL AND SIGNAL SYSTEMS				
Task J01	Install fire alarm control panel				
J02	Install supervised signal circuit				
J03	Install supervised initiator circuit				
J04	Troubleshoot trouble conditions				
J05	Identify code requirements for alarm systems				
J06	Install intercom system				
J07	Identify components of clock system circuits				
DUTY K	MAKING ELECTRICAL CALCULATIONS				
Task K01	Calculate a residential service using regular & optional methods				
K02	Calculate conductor fill-in conduct				
K03	Calculate conductor fill-in boxes				
K04	Calculate voltage drop				
K05	Calculate branch circuit sizes				
K06	Calculate feeder sizes				
K07	Calculate commercial and industrial services				
K08	Calculate mobile home services				
K09	Calculate multifamily dwelling services				
K10	Balance the total load per phase				
K11	Compute wire size for motor circuits				
DUTY L	TAKING ELECTRICAL EXAMINATIONS				
Task L01	Take sample journeyman's closed book test				
L02	Take sample journeyman's open book test				
L03	Take sample master's test				
DUTY M	APPLYING ADVANCED ELECTRICAL PRACTICES				
Task M01	Calculate lighting requirements using zonal cavity method				
M02	Calculate lighting requirements using equivalent sphere method				
M03	Design outdoor lighting installations				
M04	Evaluate effectiveness of energy-saving ideas				
M05	Design integrated overcurrent and no-fault system protection				
M06	Identify various grounding systems				
DUTY N	ESTIMATING ELECTRICAL INSTALLATIONS				
Task N01	Perform labor cost study				
N02	Identify basic estimating concepts				
N03	Take off lighting fixtures				
N04	Take off branch circuits				
N05	Take off power feeders				
N06	Determine bid requirements				
N07	Identify electrical service requirements				
N08	Determine construction characteristics from architectural plans				
N09	Identify pertinent information from mechanical drawings and specs				
N10	Take off special raceways				
N11	Take off equipment connections				
N12	Take off special systems				
N13	Prepare bid documents				
DUTY 001	SPECIAL WORK ASSIGNMENTS				

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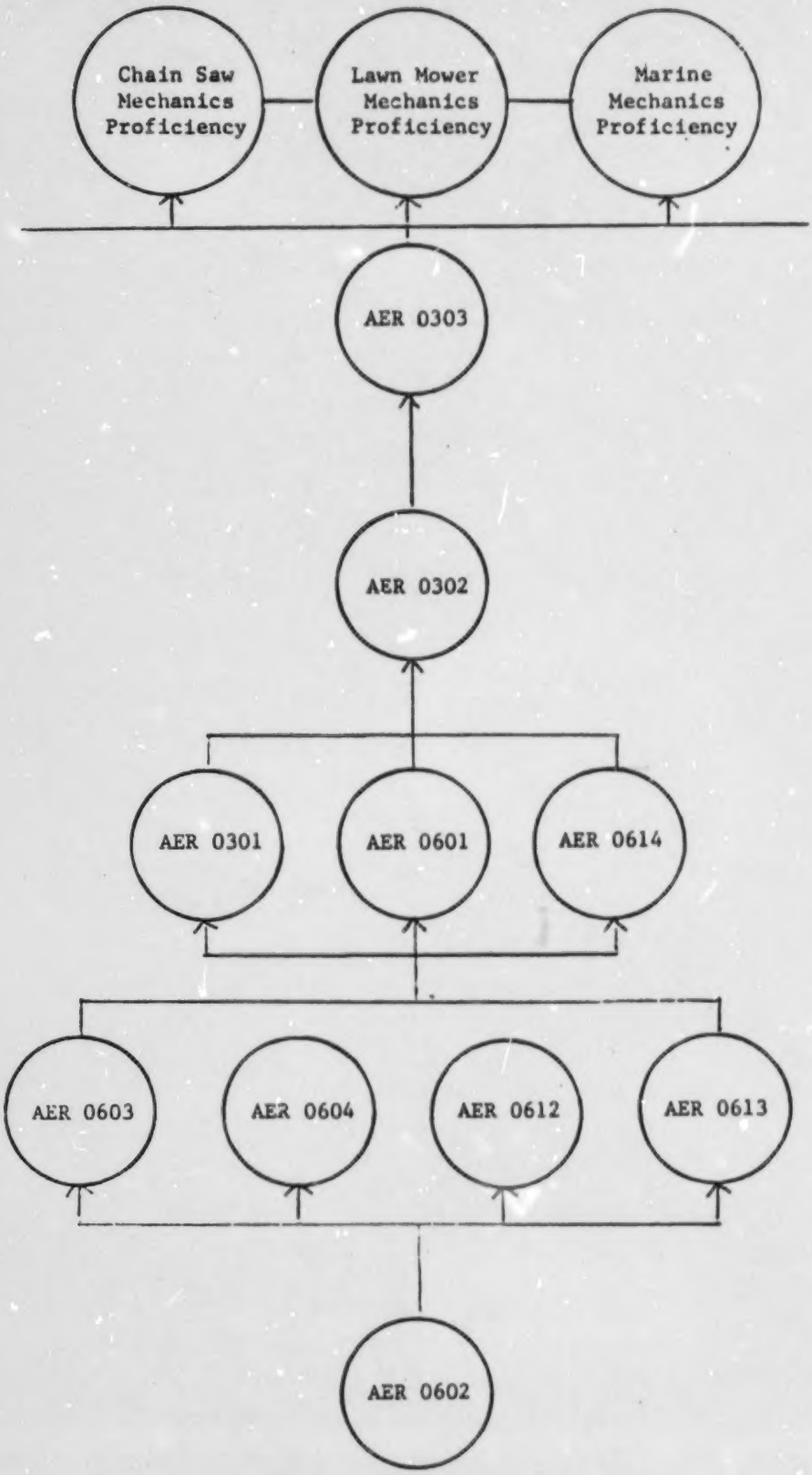
GASOLINE ENGINE MECHANICS



GASOLINE ENGINE MECHANICS

ENTRY LEVEL COMPETENCIES

Competency	Rationale	Program Competency	Evaluation
8th grade reading level	This is the minimum level for texts in this program.	The student must read repair orders, service manuals, and comprehend written instructions.	8th grade level or higher on reading scale CAT level
Math at minimum 8th grade level. Ability to add, subtract, multiply, and divide whole, mixed, fractional, and decimal numbers.	To use precision measuring instruments, hand tools, gauge bolt sizes, drill sizes, and technical specifications.	The student must use micrometers, calipers, feeler gauges, & make comparisons with specifications listed in the service manuals to determine the serviceability of engine component parts. Quickly determine bolt, wrench, and hole sizes in order to make timely repairs.	8th grade level or higher on CAT level V.
Legible handwriting	A desirable trait for a small engine mechanic.	Written description of work performed or needed. Must write legible repair estimates.	Application for entry into program.
Clear Verbal Communication	The student must communicate with the instructor and fellow students.	To communicate verbally with shop operators and customers. To participate in learning with peers.	Interview
Positive attitude towards work in a structured organization.	Mechanics generally work in shops with a defined hierarchy.	The student must respect fellow workers and supervisors while striving to produce a profit for his employer.	Interview with instructor subjective.
Pride in personal accomplishments and ability.	The mechanic's work is both physically & mentally demanding.	Self-esteem must be enhanced by the learning experience if the student is to succeed in industry.	Subjective evaluation during interview with instructor.
Intelligence, reasoning, and comprehension.	Small engines mechanics requires concentration, memory, & problem solving.	To understand instructions while learning tasks and duties of the mechanic. To apply problem-solving principles of the trade.	No suitable testing document available at this time.

Competency	Rationale	Program Competency	Evaluation
Manipulative skill and manual dexterity.	The work of the mechanic is physical and the use of tools is required.	The student will use hand tools & work on equipment with spinning blades, belts, & chains. He must function without endangering himself or others.	Subjective by instructor. May lead to extensive testing if indicated.
Physical mobility	Physical tasks of the mechanic include lifting, moving, bending, and stooping.	Disassembly, measuring, repairing, and operational testing of many types of small engines applications.	Determination will be subjective and occur during interview.

GASOLINE ENGINE MECHANICS

COURSE REQUIREMENTS		CONTACT HOURS
AER 0301	Lawn Mower Repair	90
AER 0601	Motorcycle Repair	90
AER 0602	Safety Practices	90
AER 0603	Four Cycle Construction	90
AER 0604	Two Cycle Construction	90
AER 0612	Carburetion and Combustion	90
AER 0613	Electrical and Ignition System	90
AER 0614	Engine Trouble Shooting	90
AER 0302	Engine Overhaul I	90
AER 0303	Engine Overhaul II	90
	TOTAL HOURS	900

COURSE DESCRIPTIONS

GASOLINE ENGINE MECHANICS

AER 0301 LAWN MOWER REPAIR — 90 Contact Hours

The student will be introduced to related equipment and its repair used on lawn mowers and learn to diagnose problems and repair components of self-propelled and riding lawn mowers.

AER 0601 MOTORCYCLE REPAIR — 90 Contact Hours

The student will perform motorcycle repair in a work station similar to that found in the industry and be introduced to chassis, suspension, and drive train components; their design, function and repair.

AER 0602 SAFETY PRACTICES — 90 Contact Hours

The student will be introduced to and instructed in the safe operation of basic shop tools and equipment. Student will also be given general safety rules that will apply to any shop situation.

AER 0603 FOUR CYCLE CONSTRUCTION — 90 Contact Hours

The student will be introduced to theory, basic design, and construction. Student will deal with the major parts, their purpose, and relationship to other parts of the engine.

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AER 0601 TWO CYCLE ENGINE CONSTRUCTION — 90 Contact Hours

Design and construction of the two-cycle engine, the major parts, and the differences in the two and four cycle engines will be discussed and demonstrated.

AER 0612 CARBURETION AND COMBUSTION — 90 Contact Hours

An introduction to carburetors (a fuel metering and mixing system), the comparison of different types, and how they affect combustion.

AER 0613 ELECTRICAL AND IGNITION SYSTEM — 90 Contact Hours

A description and analysis of ignition and electrical systems used on small engines.

AER 0614 ENGINE TROUBLE SHOOTING — 90 Contact Hours

A systematic diagnosis of engine problems.

AER 0302 ENGINE OVERHAUL I — 90 Contact Hours

The student will participate in the overhaul of several engines used on lawn mowers and related equipment.

AER 0303 ENGINE OVERHAUL II — 90 Contact Hours

The student will learn techniques used in the overhaul of larger multi-cylindered engines.

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GASOLINE ENGINE MECHANICS
Overall Program Outcomes

Skills Definition:

Diagnoses, repairs, and overhauls the various applications of small gasoline engines to include lawn mowers, chain saws, outboard engines, and motorcycles. Plans work procedures using manufacturer's shop manuals, service bulletins, and other manuals. Disassembles and inspects components using precision measuring instruments, meters, and gauges. Repairs or replaces parts as needed to make the engine conform to manufacturers sepcifications. Is knowledgeable of the operational theory of both two and four cycle engines and the various drive systems used in conjunction with them. Communicates with peers, supervisors, and customers regarding his work.

May be designated according to specialty, i.e., Lawn Mower Mechanic, Motocycle Mechanic, Marine Engines Mechanic.

TASK LISTING

Program

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SMALL GASOLINE ENGINES

DUTY	TASK	TITLE . Small Engines Mechanics
A		Maintaining Shop Tools and Equipment
	01	Clean a small-engine repair shop
	02	order bench stock
B		Overhauling Small Engines
	01	Replace a worn or defective pistol
	02	Install pistol rings
	03	Ridge-ream the top of a cylinder
	04	Deglaze a cylinder
	05	Replace a cylinder on a four-cylinder engine
	06	Replace a connecting rod
	07	Replace an oil seal
	08	Replace a crank shaft
	09	Replace a cam shaft
	10	Grind valves and valve seats
	11	Lap valves
	12	Replace valves and valve seats
	13	Install a short block
	14	Replace a damaged thread by using the coil
	15	Repair a damaged thread by using a tap and die set
C		Servicing Maintaining and Repairing Fuel Systems
	01	Service an oil bath cleaner
	02	Service a foam-type air cleaner
	03	Service a dry-element air cleaner
	04	Service a crankcase breather
	05	Remove, clean, and reinstall fuel filter systems
	06	Remove and clean a fuel tank and fuel lines
	07	Remove and reinstall a carburetor diaphragm
	08	Disassemble, clean, and reassemble a pulsation-type carburetor
	09	Disassemble, clean, and reassemble a vacuum-type carburetor
	10	Disassemble, clean, and reassemble a float-type carburetor
	11	Adjust a carburetor float valve
	12	Fine-tune a carburetor
	13	Disassemble, clean, and reassemble a fuel pump

TASK LISTING

Program

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SMALL GASOLINE ENGINES

DUTY	TASK	TITLE Small Engines Mechanics
D		Servicing, Maintainirg, and Repairing Ignition Systems
	01	Install spark plugs
	02	Remove, inspect, and replace a flywheel
	03	Replace a point plunger
	04	Replace points and condenser
	05	Adjust an armature air gap
	06	Test and/or replace a coil
	07	Test and/or replace ignition wire(s)
	08	Time the ignition system on a lawn mower or chain saw engine
	09	Time the ignition system on an outboard engine above 30 horsepower
	10	Test and/or replace a diode rectifier
	11	Troubleshoot a capacitor discharge ignition system
	12	Service a safety switch
E		Servicing and Maintaining Starting Circuits
	01	Charge a battery
	02	Troubleshoot a starting circuit
F		Servicing and Maintaining Manual Starters
	01	Check a manual starter for proper operation
	02	Replace a defective or worn starter spring
	03	Replace a starter clutch
	04	Replace a friction brake
	05	Replace starter pawls
	06	Replace a friction disc
	07	Replace a worn or defective cup
	08	Replace a starter rope
G		Servicing and Maintaining Charging Circuits
	01	Troubleshoot the charging circuit
	02	Inspect a belt pully and belt, and replace if necessary
	03	Replace an alternator
	04	Replace rectifiers
	05	Replace a voltage regulator
	06	Replace a diode assembly
	07	Clean a commuatator
	08	Using an armature growler, check an armature for a short
	09	Check generator or starter brushes and replace if necessary

TASK LISTING

Program

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SMALL GASOLINE ENGINES

DUTY	TASK	TITLE Small Engines Mechanics
G		Servicing and Maintainging Charging Circuits
	10	Replace alternator or generator bearings and/or bushings
	11	Check field windings and replace if necessary
	12	Adjust a cutout relay
H		Servicing and Maintaining Lawn Mower Assemblies
	01	Lubricate lawn mower
	02	Grind and balance a rotary blade
	03	Adjust the height of cut
	04	Replace belt(s)
	05	Replace a throttle cable
	06	Replace the drive cogs on a self-propelled walk-behind lawn mower
	07	Adjust a clutch control rod
	08	Replace a clutch
	09	Inspect and repair the steering assemly on a riding lawn mower
	10	Set up an oxyacetylene welder
	11	Weld a broken fram or handle by using an oxyacetylene welder
	12	Weld a broken frame or handle by using an electric welder

TASK LISTING

Program

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SMALL GASOLINE ENGINES

DUTY	TASK	TITLE: Small Engine Mechanics
I		Servicing and Maintaining Chain Saw Assemblies
	01	Lubricate a roller nose bar
	02	Check and adjust an oiler
	03	Replace and adjust a chain
	04	Set the cutting depth
	05	Replace worn or defective rails
	06	Replace a cutter bar roller
	07	Replace a worn sprocket
	08	Replace a broken drive link
	09	Sharpen a saw chain
	10	Troubleshoot cutter problems
J		Small Engines Mechanics
	01	Clean an outboard engine
	02	Lubricate a lower unit
	03	Lubricate a transom steering busing
	04	Inspect and install a propeller and a shear pin
	05	Remove, clean, and replace gas tank picup tud
	06	Replace magnet in lower unit
	07	Replace a water pump
	08	Inspect and/or replace a vertical drive gear
	09	Remove and replace a clutch dog
	10	Remove and replace a clutch oil
	11	Remove and reinstall a drive-shaft pinion
	12	Inspect and replace the main bearing and drive shaft
	13	Replace worn or defective gear drive components
	14	Replace seals in the lower unit
	15	Remove and replace a power head from lower unit
	16	Remove and replace a swivel bracket
K		Organizing and Planning
	01	Maintain a time record
	02	Plan a daily or weekly work schedule
	03	Plan the layout of a small-engine repair facility
L	95	Maintaining Lower Unit
01	20	Identify lower end unit function and operation
02	20	Overhaul lower end unit (split gear case)
03	20	Overhaul Mercury lower end unit
04	20	Remove water pump
	15	Work on special assignments

PROGRAM TASK LISTING

TASK	HOURS	SMALL ENGINES MECHANICS
M	145	Maintaining Ignition System
01	15	Identify ignition system principles
02	30	Service ignition system
03	30	Service external magneto
04	25	Service distributor
05	20	Service capacitive discharge ignition system
	25	Work on special assignments
N	127	Overhauling Powerheads
01	20	Identify powerhead functions and operation
02	20	Remove and disassemble powerhead
03	20	Hone, clean, and oil cylinder walls
04	20	Reassemble malfunctioning engine
05	30	Troubleshoot malfunctioning engine
	17	Work on special assignments
P	145	Maintaining Electrical System
01	20	Identify electrical symbols
02	40	Service starter system
03	20	Identify charging system operations
04	35	Service the charging system
	30	Work on special assignments

TASK LISTING

Program

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SMALL GASOLINE ENGINES

DUTY	TASK	TITLE Chainsaw Mechanics
I		Servicing and Maintaining Chain Saw Assemblies
	01	Lubricate a roller nose bar
	02	Check and adjust an oiler
	03	Replace and adjust a chain
	04	Set the cutting depth
	05	Replace worn or defective rails
	06	Replace a cutter bar roller
	07	Replace a worn sprocket
	08	Replace a broken drive link
	09	Sharpen a saw chain
	10	Troubleshoot cutter problems
J		Outboard Mechanics
	01	Clean an outboard engine
	02	Lubricate a lower unit
	03	Lubricate a transom steering busing
	04	Inspect and install a propeller and a shear pin
	05	Remove, clean, and replace gas tank picup tud
	06	Replace magnet in lower unit
	07	Replace a water pump
	08	Inspect and/pr replace a vertical drive gear
	09	Remove and replace a clutch dog
	10	Remove and replace a clutch oil
	11	Remove and reinstall a drive-shaft pinion
	12	Inspect and replace the main bearing and drive shaft
	13	Replace worn or defective gear drive components
	14	Replace seals in the lower unit
	15	Remove and replace a power head from lower unit
	16	Remove and replace a swivel bracket
K		Using a Parts Inventory
	01	Maintain stock level of parts
	02	Identify interchangeable parts
	03	Obtain parts from stockroom
L		Organizing and Planning
	01	Calculate business expenses
	02	Calculate a customer's credit record
	03	Calculate a daily or monthly cash balance
	04	Maintain a time record
	05	Plan a daily or weekly work schedule
	06	Plan the layout of a small-engine repair facility

TASK LISTING

Program

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SMALL GASOLINE ENGINES

DUTY	TASK	TITLE Chainsaw Mechanics
M		Selling Lawn Mowers, Chain Saws, and Outboard Motors
	01	Select an appropriate medium for advertising a product
	02	Calculate the price charge
	03	Close a sale
	04	Complete a sales slip
	05	Make a cash register entry
N		Supervising
	01	Assign individual job positions
	02	Determine the economic feasibility of repairing an engine
	03	Estimate total cost of repair
	04	Complete a parts request form
	05	Conduct safety briefings on osha regulations
	06	Calculate labor cost
	07	Enter on work orders the work performed
	08	Update a parts catalog
	09	Prepare a daily work control log or status board
	10	Orient a new employee
	11	Prepare a requisition for shop equipment of tools
	12	Prepare a warranty repair report

PROGRAM TASK LISTING

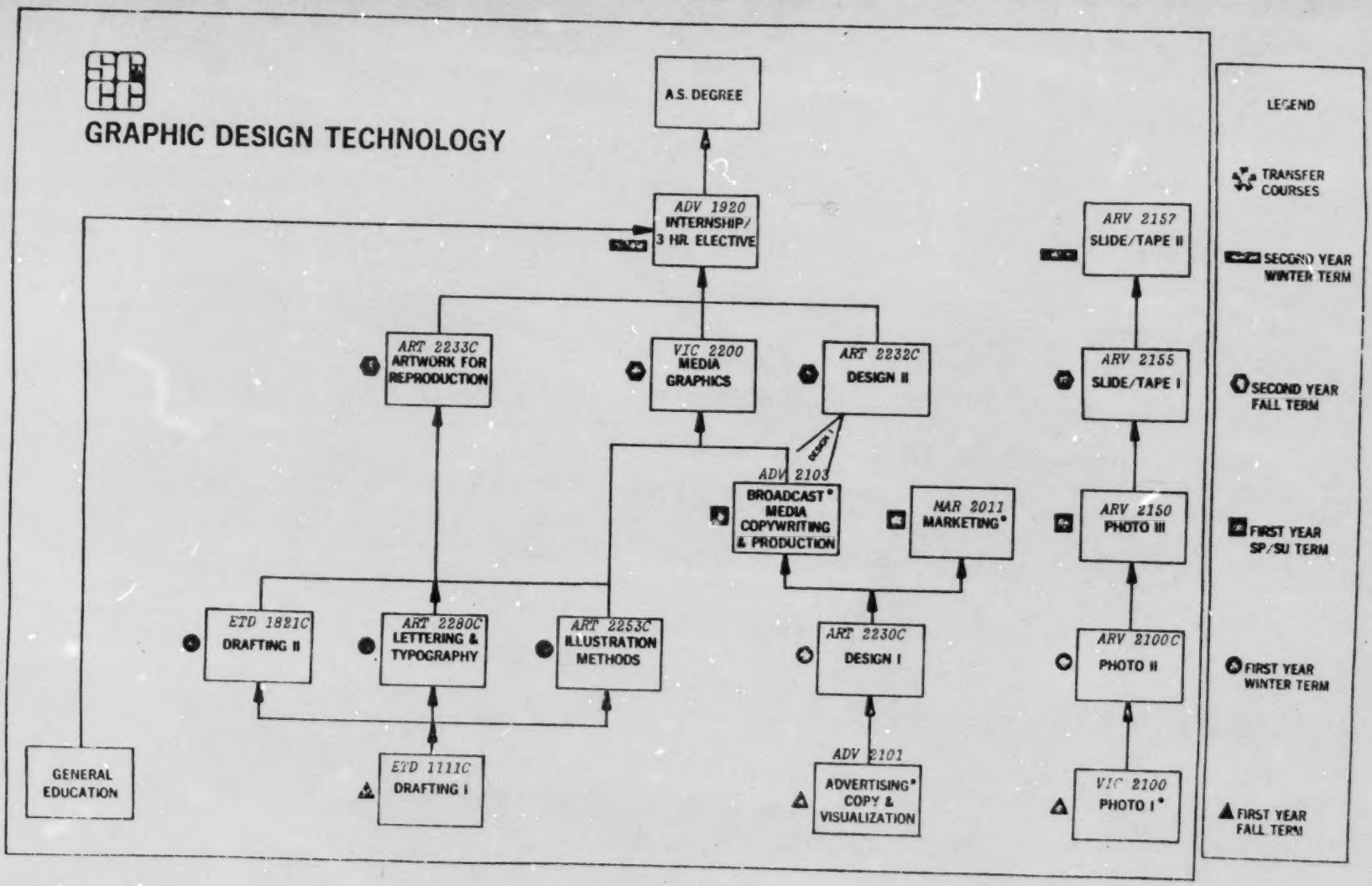
TASK	HOURS	MARINE MECHANICS
A	40	IDENTIFYING ORIENTATION PROCEDURES
01	7	Complete orientation to CBVE
02	3	Complete orientation to good work habits
03	5	Identify safety procedures in the shop
04	5	Identify and maintain tools and equipment
05	5	Identify function of outboard engines
06	15	Use manufacturer's service and parts manual
B	78	RIGGING BOAT AND MOTOR
01	20	Describe boat performance and rigging
02	20	Install motor and rigging
03	20	Install accessories
04	3	Back-up trailer
	15	Work on special assignments
C	125	MAINTAINING FUEL SYSTEM
01	25	Explain operation of the fuel system
02	25	Remove, clean and replace fuel tank and hoses
03	25	Remove, clean and replace carburetor
04	25	Service fuel pump
	25	Work on special assignments
D	95	MAINTAINING LOWER UNIT
01	20	Identify lower end unit function and operation
02	20	Overhaul lower end unit (split gear case)
03	20	Overhaul Mercury lower end unit
04	20	Remove water pump
	15	Work on special assignments
E	145	MAINTAINING IGNITION SYSTEM
01	15	Identify ignition system principles
02	30	Service ignition system
03	30	Service external magneto
04	25	Service distributor
05	20	Service capacitive discharge ignition system
	25	Work on special assignments

PROGRAM TASK LISTING

TASK	HOURS	MARINE MECHANICS
F	127	OVERHAULING POWERHEADS
01	20	Identify powerhead functions and operation
02	20	Remove and disassemble powerhead
03	20	Hone, clean and oil cylinder walls
04	20	Reassemble malfunctioning engine
05	30	Troubleshoot malfunctioning engine
	17	Work on special assignments
G	90	MAINTAINING AND REPAIRING ACCESSORIES
01	30	Service accessories
02	30	Repair steering controls
	30	Work on special assignments
H	145	MAINTAINING ELECTRICAL SYSTEM
01	20	Identify electrical symbols
02	40	Service starter system
03	20	Identify charging system operations
04	35	Service the charging system
	30	Work on special assignments
I	100	PAINTING
01	20	Prepare to refinish
02	20	Clean using steam
03	20	Remove foreign material by sand blasting
04	20	Refinish with spray paint
	20	Work on special assignments
TOTAL	945	

GRAPHIC DESIGN TECHNOLOGY

GRAPHIC DESIGN TECHNOLOGY



GRAPHIC DESIGN TECHNOLOGY

ENTRANCE SKILLS

The English Department will measure these skills. The entrance requirement is a tenth grade level.

The mathematical skills are set at a tenth grade level. The examinations are four tests from the Comparative Guidance and Placement Program of the College Board. The titles are:

Elementary Arithmetic Placement Test
Applied Arithmetic Placement Test
Elementary Algebra Placement Test
Intermediate Algebra Placement Test

In addition, the applicant will continue to take the mathematics test used by The Technical Education Department to determine entry level into the mathematics component of the program. When correlation has been established between the two sets of tests, the placement tests will determine entry level.

ENTRANCE COMPETENCIES:

1. *Basic Arithmetic Operations*
2. *Arithmetic and the Hand-Held Calculator*
3. *Fundamentals of Algebra*
4. *Use of Formulas*

EXIT COMPETENCIES:

1. *Algebra*
2. *Geometry; plane and solid*
3. *Functions ad Graphs*
4. *Ratio, Proportion, and Variations*
5. *Measurement and Measuring Instruments*
6. *Metric System*

PROGRAM OBJECTIVES

ASSOCIATE OF SCIENCE IN GRAPHIC DESIGN TECHNOLOGY

PROGRAM PURPOSE:

The Graphic Design Technology Program is designed to prepare the student for entry level positions in the broad field of graphics industry and/or entry into a program of study leading to a Bachelor's Degree in Graphic Design.

Students who obtain this degree will have completed a program of technical study at the junior/community college level. This study includes, but is not limited to, the following broad topics:

Photography
Layout
Design
Paste-up
Lettering & Typography
Advertising
Drafting

A graduate of this program shall be prepared for the following types of careers:

Photographer
Graphic Designer
Layout Artist
Mechanical Artist
Draftsperson
Radio/TV Production Technician
Advertising Account Executive
Copywriter
Illustrator
Marketing Representative

ASSOCIATE OF SCIENCE IN GRAPHIC DESIGN TECHNOLOGY: cont.

PROGRAM GOALS:

1. *The primary goal of the Program is to provide a sufficient transfer of knowledge, skills, and experience to the student, so that the student may become employable and successful in the working environment of the graphic design field.*

2. *A goal is to provide the student with a working knowledge of design theory.*

3. *A goal is to provide the student with the means to bring to bear the designer's theory upon practical, hands-on applications.*

4. *A goal is to provide the student with at least the following experiences:*

   An appreciation for life-long learning in graphic design.

   A philosophy of the work ethic.

   A philosophy of the corporation.

   An appreciation of the interrelationships of technical economics.

   An appreciation of graphic design history.

   An appreciation of the Arts in a technical society.

PROGRAM PERFORMANCE OBJECTIVES:

1. *Given the subject and sufficient information, the graphic design graduate will be able to demonstrate design and layout skills for magazine and newspaper advertisements, brochures, billboards, point-of-purchase displays, TV storyboards, trade and service marks, product packaging, and direct-mail campaigns, according to professional graphic design standards.*

2. *Given the proper equipment and facilities, the graphics graduate will be able to produce black and white color photographic illustrations that will be acceptable for use according to industry standards.*

3. *Given the subject and sufficient information, the graphic design graduate will be able to write and produce radio and television commercials, and a slide tape presentation with audio and synchronization sound tracks. These will be prepared in accordance with industry standards.*

4. *Given the proper equipment and tools, the graphic design graduate will be able to demonstrate mechanical art skills as required by the printing industry of America.*

5. *Given sufficient information, tools and facilities, the graphics graduate will be able to demonstrate basic drafting skills in accordance with industry standards.*

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ASSOCIATE IN SCIENCE IN GRAPHIC DESIGN TECHNOLOGY

COURSE	DESCRIPTION	SEMESTER HOURS CREDIT		
	Freshman	Fall	Winter	Sp/Su
ADV 2101	Advertising Copy & Visualization	3		
VIC 2100	Photography I	3		
ETD 1111C	Drafting I	3		
ENC 1103	College Composition	3		
SPC 2600	Speech	3		
ART 2280C	Lettering & Typography		3	
ARV 2100C	Photography II		3	
ETD 1821C	Drafting II		3	
ART 2230C	Design I		3	
ART 2253C	Illustration Methods		3	
ADV 2103	Broadcast Media Copywriting & Production			3
ARV 2150	Photography III			3
MAR 2011	Marketing			3
MTB 1321	Math for Technicians			3
		15	15	12
	Sophmore			
ART 2233C	Artwork for Reproduction	3		
VIC 2200	Media Graphics	3		
ART 2232C	Design II	3		
ARV 2155	Slide Tape I	3		
PSC 1101	Physical Science	3		
ADV 1920*	Internship		3	
ARV 2157	Slide Tape II		3	
STD 1100	Individual in a Changing Environment		3	
PSY 2012	General Psychology		3	
		15	12	

*If the student does not enroll in the Internship Program he/she may take one of the following as a three hour elective:

ETD 1801C	Technical Illustration
ART 1430C	Silk Screen Printing
ART 1001C	Art Fundamentals

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GRAPHIC DESIGN TECHNOLOGY

ADV 2101 ADVERTISING COPY AND VISUALIZATION 3 D

Analysis and development of advertising copywriting skills in association with graphic design principles and techniques as applied to newspaper and magazine.

ADV 2103 BROADCAST MEDIA COPYWRITING AND PRODUCTION 3 D

Advertising copy and visualization for the broadcast media. Consumer, product, or service research to serve as foundation for the graphic design and copywriting promotional effort. Preparation, direction and production of radio announcements and television commercials. Prerequisites: ADV 2101

ART 2230C DESIGN I 3 0

Analysis and application of principles and elements of design in a two-dimensional form. Color theory. Principles of composition and layout. Prerequisite: ETD 111C, ADV 2101

ART 2232C DESIGN II 3 0

Analysis and three-dimensional application of principles and elements of design in trademark design and brochure graphics. The psychology of color, typography and paper as elements of graphic design. Prerequisites: ART 2230C

ART 2233C ARTWORK FOR REPRODUCTION 3 0

Survey of modern printing methods. Execution of finished artwork and black and white mechanical drawings to serve as originals for photomechanical reproductions and subsequent printing. Prereq: EDT 1821C, ART 2280C, ART 2253C. Co-requisites: VIC 2200, ART 2232C

ART 2253C ILLUSTRATION METHODS 3 0

Principles of illustration. Survey of illustration techniques with various media: pencil, pen and ink, water colors, screens, designer colors, construction paper, textures, etc. Prereq: ETD 1821C, ART 2230C

ARV 2100C PHOTOGRAPHY II 3 0

Introduction to the view camera. Principles of architectural portrait product and commercial photography. Color and black and white. Prereq: VIC 2100

VIC 2100 PHOTOGRAPHY I 3 D

Introduction to theory and principles of black and white photography as a means of communication. Film processing, printing and finishing.

VIC 2200 MEDIA GRAPHICS 3 D

Analysis and execution of comprehensive drawings and layouts for the various print and audio/visual communications media. Direct mail, billboards, signs, graphics for TV, point-of-purchase displays and packaging. Prerequisites: ART 2230C, ADV 2101, ADV 2103, ART 2280C, ART 2253C

ART 2280C LETTERING AND TYPOGRAPHY 3 O

History and techniques of lettering, development of skills, and analysis of typographic principles. Survey of printing processes. Lettering as an element of design. Prerequisites: ETD 111C

ADV 2150 PHOTOGRAPHY III 3 O

This is a graphic design course in studio light techniques with major emphasis on advertising design in color photography. Students will fulfill specific assignments in the use of a medium format camera and applications of lighting to commercial photography.

ADV 2155 SLIDE TAPE PRESENTATION I 3 O

Given a subject for a slide show presentation, the student will create the concept, write the copy/ script and produce mechanical art for slide reproduction.

ADV 2157 SLIDE TAPE PRESENTATION II 3 O

A continuation of Slide Presentation I. The student will make kodaliths from mechanical art, color kodaliths with cels, kodaliths onto slide film, organize slides into trays, make soundtrack and synche soundtrack with slides for completed slide show presentation.

GRAPHICS DESIGN TASK LISTING

GENERAL

1. English Composition
2. Humanities
3. Social Sciences
4. General Mathematics
5. Technical Mathematics
6. Basic Algebra
7. Geometry
8. Trigonometry
9.
10.
11.

GRAPHIC DESIGN

1. Follow written instructions
2. Follow oral instructions
3. Works with supervision
4. Works without supervision
5. Independent problem solving
6. Research
7. Marketing
8. Running Blue Prints
9. Reading Blue Prints
10. Lettering with pencil
11. Lettering with ink
12. Lettering with Leroy
13. Transfer lettering/Press Type
14. Ruling with ink
15. Lucie/Overhead projector

16. Stat camera/PMT's

17. T-Square

18. Traingles

19. Pica Ruler

20. Scale photographs

21. Paste-up

22. Color separations

23. Headliner

24. Typesetting

25. Specing type

26. Type identification

27. Printing processes

28. Papers used in printing

29. Inks used in printing

30. Die-cuts

31. Embossing

32. Foil stamping

33. Sketching

34. Technical illustration

35. Perspective drawing

36. Dimensioning

37. Pen & ink line drawings

38. Water Colors

39. Markers

40. Color pencils

41. Color theory

42. Copywriting for print

43. Copywriting for radio

44. Copywriting for TV

45. Tv storyboards

46. TV production

47. Radio production

48. Magazine advertising design and layout

49. Newspaper advertising design and layout

50. Billboards

51. Point-of-purchase displays

52. Trademarks / Logo's

53. Product packaging

54. Direct mail packages

55. Brochures

56. Newsletters

57. Flyers

58. Letterhead/Envelope/Business Cards

59. T-shirts

60. 35mm Camera

61. Copy camera

62. 2¼" Format camera

63. Bulk load film

64. Process B&W film

65. Print B&W / Darkroom

66. Kodalith

67. Slide projector

68. Slide duplicator

69. Mount photo's

70. Mount slides

71. Environmental Slides

72. Studio photography - Portraits

73. " " - Products

74. " " - Location

75. " " - Models

76. Title Slides

77. Single projector slide presentations

78. Dual projector slide presentations

79. Marketing design skills

80.

81.

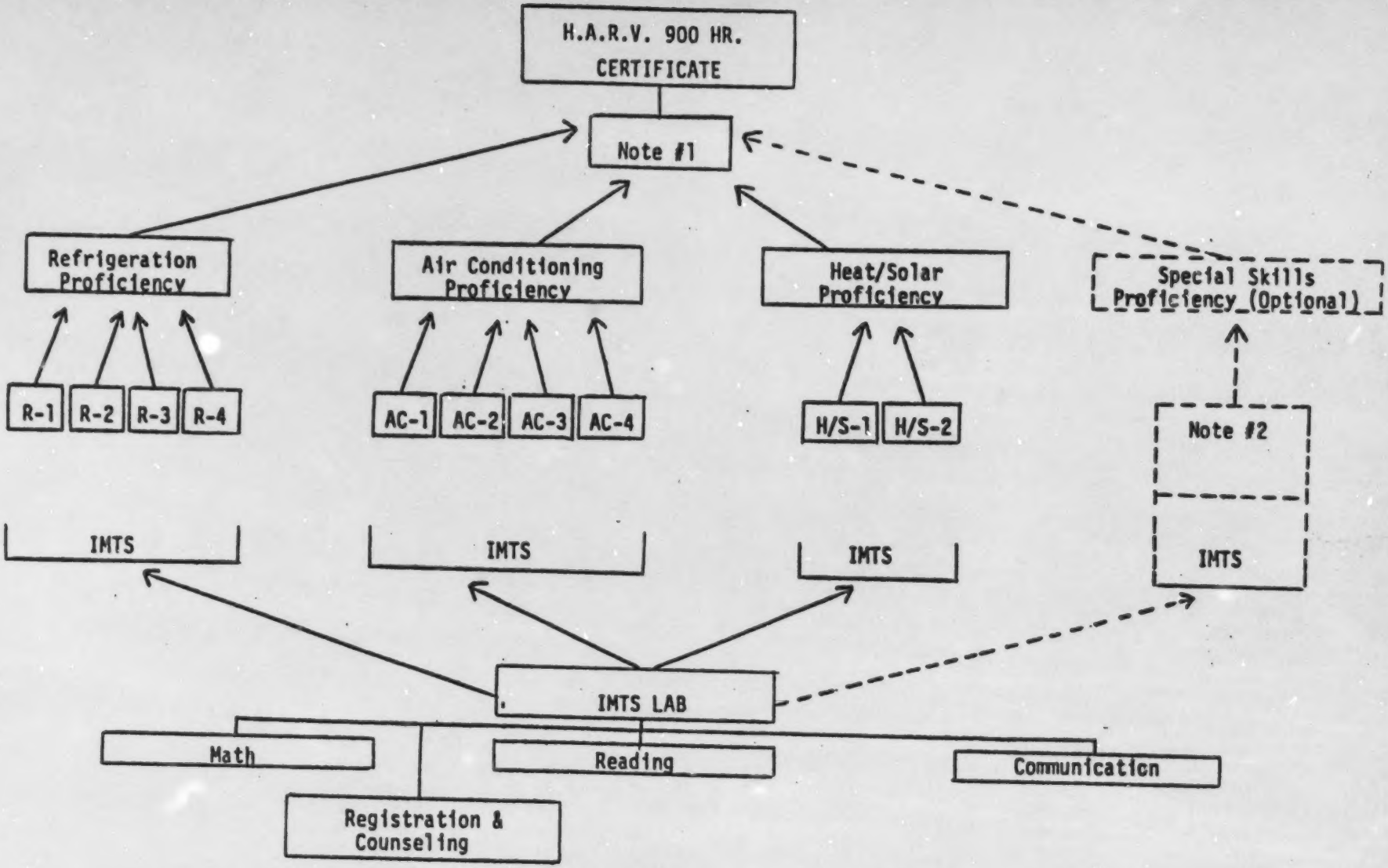
82.

83.

84.

85.

H. A. R. V.



Note #1 Proficiency required in Refrigeration, Air Conditioning, and Solar/Heat for award of HARV Certificate (Special Skills Proficiency Optional)

Note #2 Specific competencies as prescribed by faculty for Individual Needs; i.e., Appliance Repair, Apartment Complex Maintenance, Wholesale Computer Sales, Contract Sales, Special Equipment Service, etc.

IMTS (For HARV)

Math

1. General Math:
   The student must be able to add, subtract, multiply, and divide whole numbers, decimals, and fractions.

   A. Pre-Test
   B. Acceptance/Waiver by HARV Faculty

Reading

1. Reading Level:
   10th Grade Tech Manuals and Textbooks are written at this level.

   A. Pre-Test
   B. Acceptance/Waiver by HARV Faculty

Communication

1. Verbal Communication:
   Students must be able to understand oral instructions and express himself in standard English.

2. Legible Handwriting:
   Written response to work orders and employee/employer communication must be readable.

   A. Pre-Test
   B. Acceptance/Waiver by HARV Faculty

SOLAR AND HEATING, AIR CONDITIONING, REFRIGERATION AND VENTILATION

SOLAR/HARV

	COURSE REQUIREMENTS	CONTACT HOURS
ACT 0620	Refrigeration I	90
ACT 0621	Refrigeration II	90
ACT 0622	Refrigeration III	90
ACT 0623	Refrigeration IV	90
ACT 0800	Air Conditioning I	90
ACT 0801	Air Conditioning II	90
ACT 0810	Air Conditioning III	90
ACT 0811	Air Conditioning IV	90
ACT 0750	Solar Heating & Vent Systems I	90
ACT 0751	Solar Heating & Vent Systems II	90
	TOTAL HOURS	900

COURSE DESCRIPTIONS

SOLAR AND HEATING, AIR CONDITIONING, REFRIGERATION AND VENTILATION

ACT 0620 REFRIGERATION I — 90 Contact Hours

The student is introduced to the cycle and components of the refrigeration system.

ACT 0621 REFRIGERATION II — 90 Contact Hours

Refrigeration skills required in industry practices for installation and service are offered for the students development towards job entry.

ACT 0622 REFRIGERATION III — 90 Contact Hours

Refrigeration piping; loads and electrical fundamentals are presented for the students skill achievement to attain industry job level requirements.

ACY 0623 REFRIGERATION IV — 90 Contact Hours

Refrigeration circuits, both electrical and refrigerant, are offered for the students use in service techniques common in industry practices.

ACT 0800 AIR CONDITIONING I — 90 Contact Hours

Air Conditioning cycle, components, loads and piping are included in students skill development.

ACT 0801 AIR CONDITIONING II — 90 Contact Hours

Introduction to psychrometrics and industry control practices are provided for the students development towards job entry.

ACT 0802 AIR CONDITIONING III — 90 Contact Hours

Equipment and duct systems provide additional skills required for test and balance practices for industry.

ACT 0803 AIR CONDITIONING IV — 90 Contact Hours

Circuitry skills required in trouble diagnosing and repairs prepare the student for entry into service techniques.

SOLAR, HEATING AND VENT SYSTEMS

ACT 0750 SOLAR HEATING AND VENT SYSTEMS I — 90 Contact Hours

The student is introduced to the principles of solar passive and active energy efficient applications. Heat sources of gas, oil and electric applications provide the skills needed for additional development.

ACT 0751 SOLAR HEATING AND VENT SYSTEMS II — 90 Contact Hours

Hydronic and ventilating systems provide the additional skills needed for entry into industry installation and service procedures.

AIR CONDITIONING
REFRIGERATION, AND HEATING
MECHANIC
CHECKLIST OF COMPETENCIES

INSTRUCTOR_____

STUDENT_____

DATE STARTED_____

DATE COMPLETED_____

MODULE NO.	COMPETENCY	INSTRUCTORS INITIALS	DATE
AC-1	Soft Soldering		
AC-2	Brazing Joints		
AC-3	Adjusting Refrig. Door		
AC-4	Purging a Refrigerant System		
AC-5	Repairing Leaks		
AC-6	Replacing Refrig. Tubing		
AC-7	Repairing Refrig. Tubing		
AC-8	Checking Capacitors		
AC-9	Servicing Elect. Motors		
AC-10	Leveling Cabinets		
AC-11	Checking Refrigerant		
AC-12	Checking Electricity		
AC-13	Working with Elect. Components		
AC-14	Measuring Resistance		
AC-15	Measuring Voltage		
AC-16	Measuring Current		
AC-17	Apply Basic Elect. Theory		
AC-18	Working with Series Circuit		
AC-19	Working with Parallel Circuits		
AC-20	Working with Combination Circuits		
AC-21	Checking for Magnetism & Electro Magnetisms		
AC-22	Working with Relays & Solenoids		
AC-23	Checking Characteristics of Alternating Current		

MODULE NO.	COMPETENCY	INSTRUCTORS INITIALS
AC-24	Working with Transformers	
AC-25	Working with Single-Phase A.C. Induction Motors	
AC-26	Working with Three-Phase A.C. Inducition Motors	
AC-27	Checking Elect. Wiring	
AC-28	Using Elect. Servicing Wiring	
AC-29	Evacuating a Refrigerant System	
AC-30	Transferring Refrigerant	
AC-31	Charging a Refrigerant System	
AC-32	Replacing Filter-Dryers	
AC-33	Correcting Restrictions in Capillary Tube	
AC-34	Replacing Capillary Tube	
AC-35	Checking and Replacing Current Relays	
AC-36	Checking and/or replacing Compressor Overload	
AC-37	Checking Open Type Compressors	
AC-38	Checking Operation of Compressor with Service Valves	
AC-39	Testing Compressors	
AC-40	Cleanup After Burnout	
AC-41	Adding & Removing Lubrication oil	
AC-42	Replacing Semi-Hermetic Compressor	
AC-43	Replacing Hermetic Compressor	
AC-44	Checking Air Circulation Around unit	
AC-45	Installing Evaporators	
AC-46	Repairing Leak in Evaporator	

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MODULE NO.	COMPETENCY	INSTRUCTORS INITIALS	DATE
AC-47	Checking & Servicing Air-cooled Condensers		
AC-48	Replacing Air-cooled Condensors		
AC-49	Replacing Fan		
AC-50	Replacing Thermonstat		
AC-51	Replacing Breaker Strips around Doors		
AC-52	Checking Defrost, Mullion & Drain Heater		
AC-53	Replacing Defrost Heater		
AC-54	Checking Defrost Thermostat		
AC-55	Checking & Replacing Defrost Timer		
AC-56	Troubleshooting Refrigerant System		
AC-57	Repairing or Replacing Solenoid Valve		
AC-58	Checking Crankcase Heater		
AC-59	Replacing Thermostatic Motor Controls		
AC-60	Installing Motor Controls		
AC-61	Installing Heat Exchanger		
AC-62	Servicing Liquid Receivers		
AC-63	Installing Liquid Receivers		
AC-64	Adjusting & Replacing Low Pressure Controls		
AC-65	Adjusting & Replacing High Pressure Controls		
AC-66	Removing Restriction from & Adjusting Expansion valve		
AC-67	Replacing Automatic Expansion Valve		
AC-68	Adjusting Thermostatic Expansion Valve		
AC-69	Checking External Equalizer Line		
AC-70	Repairing or Replacing Hot Gas By-pass Valve		
AC-71	Checking Stepdown Transformer		
AC-72	Adjusting Heat Anticipator on Thermostat		
AC-73	Installing Thermostat Controls		
AC-74	Servicing Electronic Controls		
AC-75	Replacing Solid State Controls		
AC-76	Troubleshooting Magnetic Starter and Coil		
AC-77	Checking Potential Motor Starting Relay		
AC-78	Servicing Capacitor-Start Capacitor Run Compressor		
AC-79	Troubleshooting Elect. Circuits		
AC-80	Replacing & Adjusting Limit Switches		
AC-81	Adjusting Fan Limit Controls		
AC-82	Lighting & Adjusting Pilot		
AC-83	Adjusting Gas Burners		
AC-84	Adjusting Gas Regulator Valve		
AC-85	Checking & Replacing Heat Exchangers		
AC-86	Checking & Installing Firestats		
AC-87	Installing Heating Units		
AC-88	Installing Supplementary Heat Strips		
AC-89	Servicing Supplementary Heat Strips		
AC-90	Servicing Heat Pump Controls		
AC-91	Installing Heat Pump		
AC-92	Checking Operation of Reversing Valves		
AC-93	Installing Cooling Units		
AC-94	Balancing Water-Cooled Condensers		
AC-95	Servicing Water-Cooled Condensers		
AC-96	Replacing Water-Cooled Condensers		
AC-97	Servicing Water Towers		
AC-98	Servicing Evaporative Condensers		
AC-99	Installing Evaporative Condensers		
AC-100	Repairing Automatic Ice Makers		
AC-101	Servicing Commercial Automatic Ice Makers		
AC-102	Determining Wet & Dry Bulb Temp.		
AC-103	Determining the Size Unit Needed for Given Space		
AC-104	Preparing Requisitions For Equipment		
AC-105	Adjusting Modutrol Motor		
AC-106	Replacing Modutrol Motor		

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MODULE NO.	COMPETENCY	INSTRUCTORS INITIALS	DATE	MODULE NO.	COMPETENCY	INSTRUCTORS INITIALS
AC-107	Determining the Size and Location of Duct Systems and Registers					
AC-108	Installing Packaged Equipment					
AC-109	Selecting Evaporative Unit					
AC-110	Balancing Evaporative Unit for Adequate Air Flow					
AC-111	Checking Duct System For Distribution					
AC-112	Checking For Moisture in Controls					
AC-113	Servicing Pneu. Controls					
AC-114	Adjusting Unloaders by Crankcase pressure Method					
AC-115	Adjusting & Replacing Oil Pressure Safety Control					
AC-116	Making Dual Temperature Installation					
AC-117	Working With Solid State Devices					
AC-118	Ordering Parts from Catalog					
AC-119	Applying for a Job					
AC-120	Supervising Experience					

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TECHNICAL MATHEMATICS

FOLLOW-UP EVALUATION PROJECT
PHASE I
TECHNICAL MATHEMATICS COMPONENT

In order to evaluate the mathematical needs of the various vocational areas, two studies were undertaken. The first was a review of six general texts; four new hardback texts and two softback outlines. Four of these texts were compared to area specific booklets to determine which text provided the most coverage. The second study was an interview with area coordinators. Their response to the subject matter in the texts was recorded. Any additional subject matter required, and any preference as to a general text or booklet was also noted.

The following list comprises all of the documents considered:

A. General Texts

1. "Mathematics for Technical and Vocational Students", 7th Ed., Boyce, John G., L. Margolis, S. Slade, John Wiley & Sons, 1982.

2. "Applied Math for Technicians", 2nd Ed., Moore, C.S., B.L. Griffin, E.C. Polhamus, Jr..

3. "Introductory Technical Mathematics", Christopher, J., Prentice-Hall, 1982.

4. "Essentials of Technical Mathematics", 2nd Ed., Paul, R.S., M.L. Shaevel, Prentice-Hall, 1982.

5. "Basic Mathematics with Applications", Kruglak, H., J.T. Moore, McGraw-Hill (Schaum), 1973.

6. "Review of Elementary Mathematics", Rich, B., McGraw-Hill (Schaum), 1977.

B. Area Specific Booklets

1. "Practical Problems in Mathematics for Automotive Technicians", Moore, G., Delmar Publishers, 1979.

2. "Practical Problems in Mathematics for Carpenters", Huth, H., Delmar Publishers, 1979.

3. "Practical Problems in Mathematics for Electricians", Garrard, C.G., F.A. Boyd, Delmar Publishers, 1980.

4. "Fundamental Mathematics for Health Careers", Hayden, J.D., H.T. Davis, Delmar Publishers, 1982.

5. "Practical Problems in Mathematics for Heating and Cooling Technicians", DeVore, R., Delmar Publishers, 1981.

6. "Practical Problems in Mathematics for Masons", Ball, J.E., Delmar Publishers, 1980.

The results of the two studies are as follows:

A. Text comparisons are found on the following pages.

B. The general text which provides the most coverage in the most appropriate format is "Mathematics for Technical and Vocational Students". The cost of this text. $18.95, is considered a major drawback.

C. In terms of price, "Review of Elementary Mathematics" would be the choice at $5.95.

D. The area coordinator responses are listed.

E. In general, the content required is less than a text, but more than a booklet.

F. Their preference is for an area specific document with additional information provided by the area instructor.

G. Low cost is an important consideration for the material used.

FOLLOW UP EVALUATION PROJECT

TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)											
Applied Math for Technicians Subject List	Automotive Tech.	Carpenter	Electrician	Health	HARV	Mason						
Whole Numbers	X	X	X		X	X						
Fractional Numbers	X	X	X	X	X	X						
Decimal Numbers	X	X	X	X	X	X						
Special Topics in Arith.												
Systems of Measure	X	X	X	X	X	X						
Measurement & Devices		X			X	X						
Signed Nos. & Simple Eqs.	X											
Powers & Roots	X	X	X			X						
Simple Algebra												
Percents	X	X	X	X	X	X						
Ratio & Proportion	X	X		X	X							
Perimeters, Area & Volume	X	X										
Using Formulas	X		X		X							
Graphs	X			X								
Practical Trigonemetry			X		X							
Special Topics												
XXXXXXXXXXXXXXXXXXXXXXXX												
Invoices	X											
Estimating		X			X	X						
Apothecaries Measure				X								
Stretchouts & Arc Length					X							
Metric				X								

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FOLLOW UP EVALUATION PROJECT

TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)											
Theory & Problems of Basic Mathematics Subject List	Automotive Tech.	Carpenter	Electrician	Health	HARV	Mason						
Decimal Fractions	X	X	X	X	X	X						
Measurement	X	X	X	X	X	X						
Common Fractions	X	X	X	X	X	X						
Percentage	X	X	X	X	X	X						
Essentials of Algebra	X											
Ratio & Proportion	X	X		X								
Linear Equations												
Exponents & Radical	X	X	X			X						
Logarithms												
Quadratic Eq. & Sq. Root												
Plane Geometry		X			X	X						
Solid Figures						X						
Trigonometry			X		X							
Vectors												
Radian Measure												
Conic Sections												
Triangles												
XXXXXXXXXXXXXXXXXXXXXXXXX												
Whole Numbers	X	X	X		X	X						
Estimating		X				X						
Formulas	X		X		X							
Graphs	X			X								
Invoices	X				X							
Metric				X								
Apothecaries Measure				X								
Stretchout & Arc Length					X							

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FOLLOW UP EVALUATION PROJECT

TECHNICAL MATHEMATICS COMPONENT
AREA COORDINATOR RESPONSES

General Text	Area Specific (Inst.)												
Mathematics for Technical and Vocational Students	Automotive Ralph Carlysle		Cosmetology Orie Nelson		Electrical John Gentry		HARV Tom Tillman						
Subject List													
Metric System	X		X		X								
Common Fractions	X		X		X		X						
Decimal Fractions	X		X		X		X						
Percentages	X		X		X		X						
Ratio & Proportion	X		X		X		X						
Practical Algebra	X				X								
Rectangles & Triangles					X								
Regular Polygons&Circles					X								
Solids													
Measurement	X				X		X						
Graphs	X				X		X						
Measuring Instruments	X				X								
Geometrical Construction													
Logarithms					X								
Essentials of Trig.					X								
Strength of Materials													
Work and Power	X				X								
Tapers													
Speed Ratios of													
Pulleys & Gears	X				X								
Screw Threads					X								
Cutting Speed & Feed													
Gears													
XXXXXXXXXXXXXXXXXXXXXXXXX													
Whole Numbers	X		X		X		X						
Invoices			X										
Estimating	X		X		X								
Apothecaries &			X										
Household Measures							X						
Stretchout & Arc Length					X								
Scientific Notation													
Special Terms					X								

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FOLLOW UP EVALUATION PROJECT

TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)											
Theory & Problems of Basic Mathematics Subject List	Automotive Tech.	Carpenter	Electrician	Health	HARV	Mason						
Decimal Fractions	X	X	X	X	X	X						
Measurement	X	X	X	X	X	X						
Common Fractions	X	X	X	X	X	X						
Percentage	X	X	X	X	X	X						
Essentials of Algebra	X											
Ratio & Proportion	X	X		X								
Linear Equations												
Exponents & Radical	X	X	X			X						
Logarithms												
Quadratic Eq. & Sq. Root												
Plane Geometry		X			X	X						
Solid Figures						X						
Trigonometry			X		X							
Vectors												
Radian Measure												
Conic Sections												
Triangles												
XXXXXXXXXXXXXXXXXXXXXXXXX												
Whole Numbers	X	X	X		X	X						
Estimating		X				X						
Formulas	X		X		X							
Graphs	X			X								
Invoices	X				X							
Metric				X								
Apothecaries Measure				X								
Stretchout & Arc Length					X							

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FOLLOW UP EVALUATION PROJECT

TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)											
Mathematics for Technical and Vocational Students Subject List	Automotive Tech.	Carpenter	Electrician	Health	HARV	Mason						
Metric System				X								
Common Fractions	X	X	X	X	X	X						
Decimal Fractions	X	X	X	X	X	X						
Percentages	X	X	X	X	X	X						
Ratio & Proportion	X	X	X	X	X							
Practical Algebra	X		X		X							
Rectangles & Triangles		X			X	X						
Regular Polygons&Circles		X			X	X						
Solids		X			X	X						
Measurement	X	X	X	X	X	X						
Graphs	X			X								
Measuring Instruments												
Geometrical Construction												
Logarithms	X	X	X			X						
Essentials of Trig.			X		X							
Strength of Materials												
Work & Power	X											
Tapers												
Speed Ratios of												
Pulleys & Gears												
Screw Threads												
Cutting Speed & Feed												
Gears												
XXXXXXXXXXXXXXXXXX												
Whole Numbers	X	X	X		X	X						
Invoices	X				X							
Estimating		X				X						
Apothecaries &												
Household Measures				X								
Stretchouts & Arc Length					X							

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FOLLOW UP EVALUATION PROJECT

TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)											
Review of Elementary Mathematics Subject List	Automotive Tech.	Carpenter	Electrician	Health	HARV	Mason						
Number System	X	X	X	X	X	X						
Addition & Mult.	X	X	X	X	X	X						
Subtraction & Division	X	X	X	X	X	X						
Fractions	X	X	X	X	X	X						
Decimals	X	X	X	X	X	X						
Percents	X	X	X	X	X	X						
Fundamental Algebra	X	X	X			X						
Equations	X	X	X									
Fundamental Geometry	X	X			X	X						
Figures & Formulas	X	X	X	X	X							
Ratio, Proportion, Rates	X	X	X	X	X							
Fundamental Trig.			X		X							
Signed Numbers	X	X	X	X								
XXXXXXXXXXXXXXXXXXXXXXX												
Measurement	X	X	X	X	X	X						
Invoices	X				X							
Estimating		X				X						
Metric				X								
Stretchout & Arc Length					X							

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FOLLOW-UP EVALUATION PROJECT
PHASE II
TECHNICAL MATHEMATICS COMPONENT

The Phase II evaluation covers the following five program areas: Graphic Design, Drafting, Data Processing, Child Development, and Clothing Production & Fashion Merchandising.

The results of the evaluation are as follows:

A. The list of all documents considered.

B. The Graphic Design, Drafting, and Data Processing programs would be well-served by Tech Math II or equivalent.

C. The Child Development and Clothing Production & Fashion Merchandising programs would be well-served by Tech-Math I or equivalent.

D. The text that would be most appropriate for Tech Math II is "Technical Mathematics" by Calter.

E. The text, depending on cost, that would be most appropriate for Tech Math I would be:

   1) "Basic Mathematics for Trades and Technologies" by Cleaves, Hobbs, and Dudenhefer (high cost, broad coverage)

   2) "Review of Elementary Mathematics" by Rich (low cost, outline format)

F. Text comparisons by program are included.

G. Concept Maps for Tech Math I & II are diagrammed and explained.

DOCUMENT LIST: Phase II, Follow-Up Project

A. General Texts

1. "Technical Mathematics", Calter, Paul, Prentice-Hall, 1983.

2. "Fundamentals of Technical Mathematics", Kramer, A.D., McGraw-Hill, 1982.

3. "Technical Mathematics with Applications", Goodson, C.E., S.L. Miertschin, John Wiley & Sons, 1983.

4. "Mathematics for Technical and Vocational Students", 7th Ed., Boyce, J.G., L. Margolis, S. Slade, John Wiley & Sons, 1982.

5. "Applied Math for Technicians", 2nd Ed., Moore, C.S., B. Griffin, E. Pelhamus, Prentice-Hall, 1982.

6. "Theory and Problems of Basic Mathematics", Kruglak, H., J. Moore, McGraw-Hill, 1973.

7. "Review of Elementary Mathematics", Rich, B., McGraw-Hill, 1977.

8. "Technical Mathematics", Austin, J., M. Isern, Saunders College Publishing, 1983.

9. "Basic Mathematics for Trades and Technologies", Cleaves, C., M. Hobbs, P. Dudenhefer, Prentice-Hall, 1983.

10. "Microcomputer Courseware for Technical Mathematics", Burke, R., A. Kramer, McGraw-Hill, 1982.

11. "Applied General Mathematics", Smith, R., Delmar Publishers, 1982.

12. "Vocational-Technical Mathematics", Smith, R., Delmar Publishers, 1983.

B. Booklets:

1. "Solving Mathematical Word Problems", Lawing, B., Delmar Publishers, 1983.

2. "Merchandising Mathematics", Carlo, P., D. Murphy, Delmar Publishers, 1981.

3. "Measuring", Hinrichs, R., Delmar Publishers, 1981.

4. "Mathematics for Careers", Curriculum Committee of St. Paul Area, Technical-vocational Institute, Delmar Publishers, 1981. (Series)
   a) Adding and Subtracting Whole Numbers
   b) Consumer Applications
   c) Decimals
   d) Fractions
   e) Measurement and Geometry
   f) Mixed Numbers
   g) Multiplying and Dividing Whole Numbers
   h) Percents

TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)												
Technical Mathematics Paul Calter, author	Graphics Design	Drafting	Data Processing	Child Develop mnt	Clothing								
Subject List													
Numerical Computation	E	L	E		E								
Geometry	L	L											
Intro. to Algebra	E	L	E										
Simple Equation & Word Problems	E	L	L		E								
Functions & Graphs	L	L											
Right Triangles	L	L											
Factors & Factoring	L	L	L										
Fraction & Fractional Equations	L	L	L		E								
Systems of Linear Equ. & Determinants	L	L	L										
Radicals		L	L										
Quadratic Equations		L											
Trig. Functions of Any Angle, Radian Measure & Rotation	L	L	L										
Oblique Triangles	L	L											
Graphs of the Trig. Functions		L											
Trig. Identities & Eq.		L											
Functional Variation		L											
Exponential & Logarithmic Functions		L											
Complex Numbers		L											
Inequalities	E	L	L										
The Straight Line	E	L											

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TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)											
Fundamentals of Technical Mathematics Subject List	Graphics Design	Drafting	Data Processing	Child Development	Clothing							
Arithmetic and the Hand-Held Calculator	E	E	L		L							
Fund. of Algebra	E	E	L									
Measurement: Basic Geometry & Trig.	L	L			E							
Linear Systems and Determinants	L	L										
Ratio, Proportion, & Variation	L	E	L									
Factoring, Fractions, & the Quadratic Eq.	L	L										
Exponents & Radicals		L	L									
Trigonometry		L										
Trigonometric Graphs		L										
Exponential & Logarithmic Functions		L	L									
Complex Numbers		L										
Analytic Geometry & Quadratic Systems		L										
Polynomial Functions & Higher Degree Eq.		L										
Series & the Binomial Formulas		L										
Trig. Identities & Eq.		L										
Inequalities & Intro. to Linear Programming		L										
Intro. to Computers & BASIC	L	L	L									

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TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)												
Technical Mathematics With Applications Subject List	Graphics Design	Drafting	Data Processing	Child Developmnt	Clothing								
Basic Algebra Review	E	L	L										
Functions and Graphs	L	L											
Linear Functions, Equations & Inequalities	L	L	L										
Intro. to Trigonometry		L											
Systems of Linear Eq.		L											
Nonlinear Expressions, Equations, Inequalities, and Systems		L											
Fractions Involving Algebraic Expressions	L	L											
Oblique Triangles & Vectors		L											
Graphs of Trig. Functions		L											
Trig. Formulas, Identities, & Eq.		L											
Logarithmic and Exponential Functions		L	L										
Polar Coordinates and Complex Numbers		L											
Plane Analytic Geom.		L											
Higher Degree Equations		L											
Series & Sequences	L	L	L										
Intro. to Probability and Statistics		L	L										

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TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)											
Mathematics for Technical and Vocational Students Subject List	Graphics Design	Drafting	Data Processing	Child Developmnt.	Clothing							
Metric System	L	N/A			L							
Common Fractions	E	E	E		E							
Decimal Fractions	E	E	E		E							
Percentages	E	E	E		L							
Ratio & Proportion	L	E	E									
Practical Algebra	E	L	L									
Rectangles & Triangles	E	L										
Regular Polygons & Circles	L											
Solids	L	L										
Measurement	L	E			E							
Graphs	L	L										
Measuring Instruments	L	E			E							
Geometrical Construction	L	L										
Logarithms		L	L									
Essentials of Trig.		L										
Strength of Materials		L										
Work & Power		L										
Tapers		L										
Speed Ratios of Pulleys & Gears		L										
Screw Threads		L										
Cutting Speed & Feed Gears		L										
XXXXXXXXXXXXXXXXXXXX												
Whole Numbers	E	E	E									
Invoices	L	L										
Estimating	L	L										
Apothecaries & Household Measures		L										
Stretchouts & Arc Length		L										

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TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)												
Applied Math for Technicians Subject List	Graphics Design	Drafting	Data Processing	Child Developmnt	Clothing								
Whole Numbers	E	E	E	E	E								
Fractional Numbers	E	E	E	E	E								
Decimal Numbers	E	E	E	E	E								
Special Topics in Arith.		E											
Systems of Measure	L	E			E								
Measurement & Devices	L	E			E								
Signed Nos. & Simple Eq.	L	L	E	L									
Powers & Roots	L	E	L										
Simple Algebra	E	E	L	L									
Percents	L	E	E	E	L								
Ratio & Proportion	L	E		L									
Perimeters, Area & Volume		E		L									
Using Formulas	L	E	L	L									
Graphs	L	L		L									
Practical Trigonometry		L											
Special Topics		L		L									
XXXXXXXXXXXXXXXXXXXX													
Invoices	L	L											
Estimating	L	L											
Apothecaries Measure		L											
Stretchouts & Arc Length		L											
Metric	L	N/A			L								

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TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)											
Theory & Problems of Basic Mathematics	Graphics Design	Drafting	Data Processing	Child Developmnt.	Clothing							
Subject List												
Decimal Fractions	E	E			L							
Measurement	L	E			E							
Common Fractions	E	E	E		E							
Percentage	L	E	E		L							
Essentials of Algebra	L	E	L									
Ratio & Proportion	L	E										
Linear Equations	L	L	L									
Exponents & Radical		L										
Logarithms		L	L									
Quadratic Eq. & Sg. Root		L	L									
Plane Geometry	L	L										
Solid Figures	L	L										
Trigonometry		L										
Vectors		L										
Radian Measure		L	L									
Conic Sections	L	L										
Triangles	L	L										
XXXXXXXXXXXXXXXXXXXX												
Whole Numbers	E	E			E							
Estimating	L	L										
Formulas	L	L										
Graphs	L	L										
Invoices	L	L										
Metric	L	N/A										
Apothecaries Measure		L										
Stretchout & Arc Length		L										

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TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)												
Review of Elementary Mathematics Subject List	Graphics Design	Drafting	Data Processing	Child Develop mnt	Clothing								
Number System	E	E	L	E	E								
Addition & Mult.	E	E	E	E	E								
Subtraction & Division	E	E	E	E	E								
Fractions	E	E	E	E	E								
Decimals	E	E	E	E	E								
Percents	E	E	E	E	L								
Fundamental Algebra	E	L		L									
Equations	E	L	L	L									
Fundamental Geometry	L	L		L									
Figures & Formulas	L	L	L	L									
Ratio, Proportion, Rates	L	E		L									
Fundamental Trig.		L											
Signed Numbers	L	L	L	L									
XXXXXXXXXXXXXXXXXXXX													
Measurement	L	E		E	E								
Invoices	L	L		L									
Estimating	L	L											
Metric	L	N/A		L	L								
Stretchout & Arc Length		L											

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TECHNICAL MATHEMATICS COMPONENT

General Text	Area Specific (Text)											
Technical Mathematics by J. Austin, M. Isern	Graphics Design	Drafting	Data Processing	Child Developmnt	Clothing							
Subject List												
Basic Arith. Operations	E	E	E	E	E							
Applied Geometry	E	L		L								
Basic Algebraic Oper.	E	L	L	L								
Linear Equations	E	L	L	L								
Graphs	E	L		L								
Factoring	L	L		L								
Algebraic Fractions	E	L										
Systems of Linear Eq.	L	L	L									
Exponents and Scientific Notation		L	L									
Roots and Radicals		L										
Quadratic Equations		L										
Logarithms		L	L									
Trigonometry		L										

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Concept Map: Tech Math I, MTB 1321

The Student will:

A. have passed the MTB 1321 screening exam

B. review basic arithmetic operations

C. be introduced to basic algebraic concepts, and carry out solution techniques

D. be introduced to basic concepts involving exponents and logarithms, and carry out solution techniques

E. be introduced to basic plane and solid geometry, and trigonometry, and carry out solution techniques

LEARNING OUTCOMES

A. Prerequisite material.

B. Given simple arithmetic operations, the student will perform these operations in the proper order. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

C. Given problems involving operations with signed numbers, ratio and proportion, and simple linear equations, the student will use standard techniques to arrive at solutions. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

D. Given problems involving the use of exponents, logarithms, and associated simple equations, the student will use standard techniques to arrive at solutions. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

E. Given problems involving basic plane and solid geometry, and operations using simple trigonometry, the student will use standard techniques to arrive at solutions. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

Concept Map: Tech Math II, MTB 1322

The Student will:

A. have passed the MTB 1322 screening exam, or completed MTB 1321 with a grade of C or better.

B. review algebraic concepts

C. manipulate functions and graph functions

D. solve problems in right angle trigonometry

E. solve systems of linear equations in two unknowns by graphical, algebraic and determinant methods

F. manipulate binomial and trinomial functions by factoring

G. solve quadratic equations

H. manipulate trigonometric functions of any angle, and solve practical problems

I. manipulate vectors and solve practical problems

J. graph simple trigonometric functions

K. manipulate exponents and radicals

L. solve simple problems involving the j-operator

M. solve simple problems involving logarithmic and exponential functions

LEARNING OUTCOMES

A. Prerequisite material

B. Given simple algebraic operations, the student will perform these operations using standard techniques to arrive at solutions. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

C. Given simple algebraic functions, the student will manipulate dependent and independent variables, and graph such functions in standard form. To be rated as acceptable, the student must handle and graph correctly at least 71% of the problems.

D. Given simple practical problems in right angle trigonometry, the student will solve these problems using standard techniques. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

E. Given simple systems of linear equations in two unknowns, the student will apply techniques of graphical, algebraic, and determinant methods to arrive at solutions. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

F. Given binomial and trinomial functions, the student will manipulate these functions by the technique of factoring. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

G. Given quadratic equations, the student will solve these equations by standard techniques. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

H. Given simple practical problems involving the use of trigonometric functions of any angle, the student will manipulate and solve these problems by standard techniques. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

I. Given simple practical problems involving the use of vectors, the student will apply standard techniques to arrive at solutions. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

J. Given simple trigonometric functions, the student will graph such functions in standard form. To be rated as acceptable, the student must handle and graph correctly at least 71% of the problems.

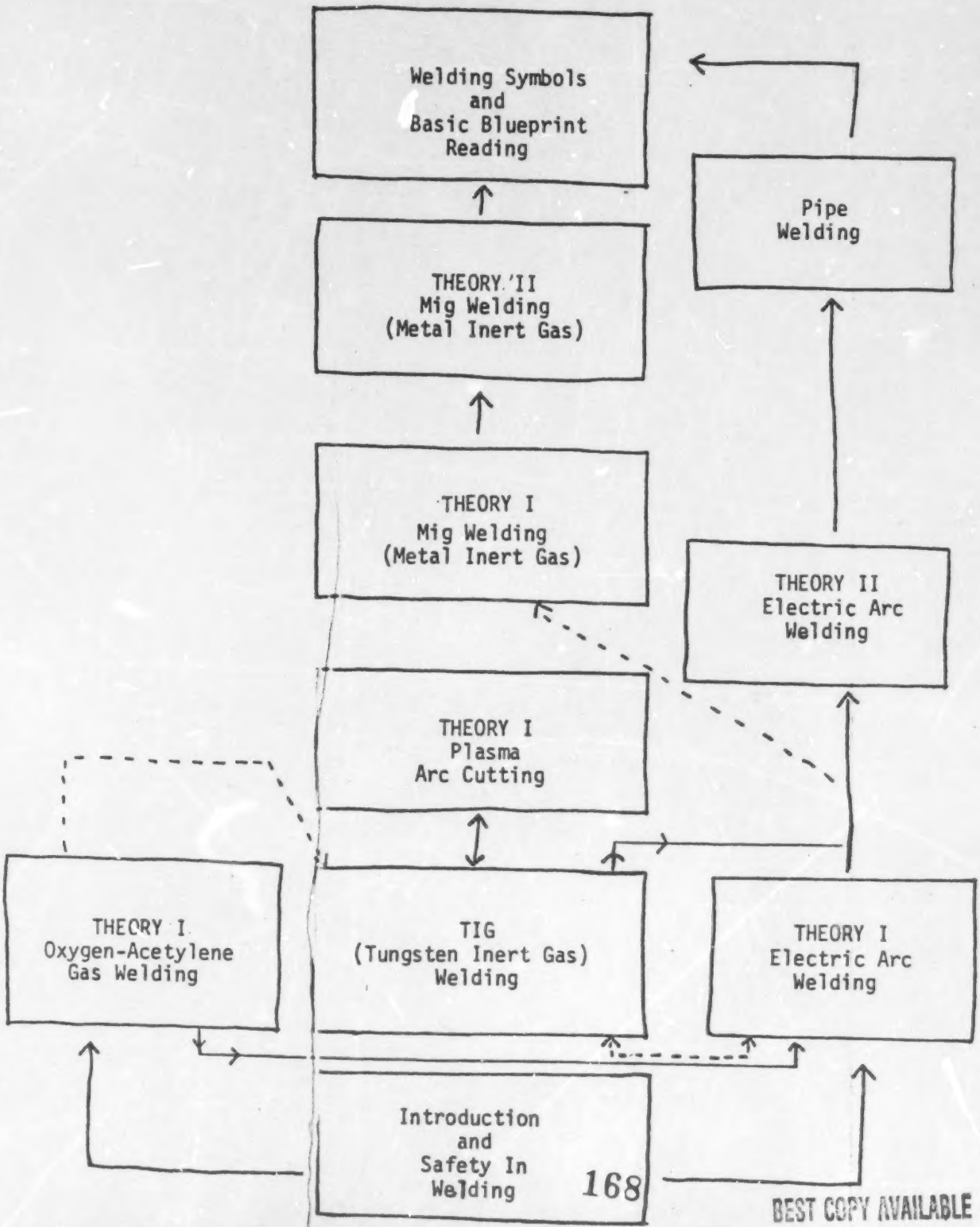
K. Given simple problems involving the use of exponents and radicals, the student will apply standard techniques to manipulate and solve these problems. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

L. Given simple problems involving the use of the j-operator, the student will solve these problems by standard techniques. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

M. Given simple problems involving the use of logarithmic and exponential functions, the student will solve these problems by standard techniques. To be rated as acceptable, the student must solve correctly at least 71% of the problems.

WELDING

PROGRAM MAP


Welding Symbols and Basic Blueprint Reading
Pipe Welding
THEORY II Mig Welding (Metal Inert Gas)
THEORY I Mig Welding (Metal Inert Gas)
THEORY II Electric Arc Welding
THEORY I Plasma Arc Cutting
THEORY I Oxygen-Acetylene Gas Welding
TIG (Tungsten Inert Gas) Welding
THEORY I Electric Arc Welding
Introduction and Safety In Welding

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	COURSE REQUIREMENTS	CONTACT HOURS
MTR 0804	Introduction and Safety In Welding	90
MTR 0120	Theory I, Electric Arc Welding	90
MTR 0121	Theory II, Electric Arc Welding	90
MTR 0151	Theory I, Oxygen-Acetylene Gas Welding	90
MTR 0122	Theory I, MIG (Metal Inert Gas) Welding	90
MTR 0123	Theory II, MIG (Metal Inert Gas) Welding	90
MTR 0126	TIG (Tungsten Inert Gas) Welding	90
MTR 0127	Theory I, Plasma Arc Cutting	90
MTR 0140	Pipe Welding	90
MTR 0801	Welding Symbols and Basic Blueprint Reading	90
	TOTAL HOURS	900

COURSE DESCRIPTIONS

WELDING

MTR 0804 INTRODUCTION AND SAFETY IN WELDING — 90 Contact Hours

Fundamentals of shop practices in welding, welding equipment and metal working tools. Shop safety and O.S.H.A. safety rules in industry will be taught.

MTR 0120 THEORY I, ELECTRIC ARC WELDING — 90 Contact Hours

A beginning course in welding principles to familiarize the student with basic movements and positions. Welding rod identification is introduced at the beginning of this course.

MTR 0121 THEORY II, ELECTRIC ARC WELDING — 90 Contact Hours

Safety instruction is emphasized in this course. The development of attitudes that are important to the welding trade are expressed. The five basic joints in the four positions will be taught and practiced using low hydrogen welding rods.

MTR 0151 THEORY I, OXYGEN-ACETYLENE GAS WELDING — 90 Contact Hours

Theory of application and techniques of oxygen-acetylene welding, brazing, flame cutting and equipment.

MTR 0122 THEORY, M.I.G. (METAL INERT GAS) WELDING — 90 Contact Hours

Identification of M.I.G. welding equipment, demonstrate use, application and safe operation on ferrous type metals.

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MTR 0123 THEORY II, M.I.G. (METAL INERT GAS) WELDING — 90 Contact Hours

A continuation of Theory I with application and operation focused on non-ferrous types of metals (stainless stell, aluminum, etc.)

MTR 0126 T.I.G. (TUNGSTEN INERT GAS) WELDING — 90 Contact Hours

Identification of T.I.G. welding equipment, demonstrate use, application and safe operation on ferrous and non-ferrous type metals. Special attention will be given to aluminum welding.

MTR 0127 THEORY I, PLASMA ARC CUTTING — 90 Contact Hours

A new system devised to cut metals with a plasma arc cutting machine that is very useful in cutting non-ferrous metals.

MTR 0140 PIPE WELDING — 90 Contact Hours

Demonstrate pipe welding, cutting, layout, template making and fit up procedures using the (SMAW) process.

MTR 0801 WELDING SYMBOLS AND BASIC BLUEPRINT READING — 90 Contact Hours

Basics of blueprint designs and symbols used in welding and metal fabrication. How to read and interpret blueprints and symbols.

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WELDING

PROGRAM TASK LISTING

TASK	
Duty A	IDENTIFYING ORIENTATION AND SAFETY PRACTICES IN WELDING
01	Complete orientation to CBVE
02	Complete orientation to work habits and attitudes
03	Identify safety practices
04	Operate audiovisual equipment
Duty B	DEVELOPING EMPLOYABILITY SKILLS
01	Prepare for a job interview
02	Conduct a job search
03	Demonstrate knowledge of job changes
Duty C	WORKING WITH BLUEPRINTS
01	Interpret detailed drawing
02	List materials for fabrication from blueprint
03	Develop shop drawings
Duty D	IDENTIFYING MATERIALS
01	Identify metals by appearance and weight
02	Identify metals by spark test
03	Classify metals by magnetic properties
Duty E	OPERATING EQUIPMENT AND TOOLS
01	Perform cutting operations manually
02	Perform bending operations manually
03	Perform finishing operations manually
04	Perform cutting operations with power equipment
05	Perform bending operations with power equipment
06	Perform drilling operations with power equipment
07	Perform punching operations with power equipment
08	Perform finishing operations with power equipment
Duty F	OPERATING GAS WELDING EQUIPMENT
01	Setup oxy-fuel equipment
02	Gas weld carbon steel joints
03	Gas weld cast iron
04	Braze ferrous and nonferrous metals
05	Silver braze copper pipe joints
06	Lead solder ferrous and nonferrous metals
07	Hand form metals with gas equipment
08	Remove distortion using gas equipment
09	Cut carbon steel using oxy-fuel equipment

PROGRAM TASK LISTING

TASK	
Duty F	OPERATING GAS WELDING EQUIPMENT (cont'd)
10	Weld butt joints: horizontal position
11	Weld single & multiple pass lap joints: vertical position
12	Weld 3 pass & 6 pass "tee" joints: vertical position
13	Weld outside corner joints: vertical position
14	Weld butt joints: vertical position
15	Weld single & multiple pass lap joints: overhead position
16	Weld 3 pass & 6 pass "tee" joints: overhead position
17	Weld outside corner joints: overhead position
18	Weld butt joints: overhead position
19	Weld with the low-hydrogen electrodes
20	Weld vee-bend plates in all positions
Duty G	OPERATING GAS SHIELDED ARC WELDING EQUIPMENT
01	Assemble tig torch and prepare to tig weld
02	Weld mild steel with tig equipment
03	Weld stainless steel with tig equipment
04	Weld aluminum with tig equipment
05	Assemble mig torch and prepare to mig weld
06	Weld mild steel with mig equipment
Student selects one of the following duties:	
DUTY H	PERFORMING STRUCTURAL AND EQUIPMENT OPERATIONS
01	Fabricate metal devices for structural equipment
02	Fabricate metal work stands and furniture
03	Fabricate storage area
04	Perform weld repair operations on equipment
Duty I	PREPARING AND WELDING PIPE JOINTS
01	Cut, bevel and fit pipe joints
02	Tackweld and weld pipe